**3GPP TSG-RAN WG3 Meeting #124 *R3-243896***

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

**Title:** (TP to BL CR for TS 38.423) Support ECN Marking and Congestion Information Reporting in DC

**Source:** Ericsson, Deutsche Telekom, Charter, BT, Nokia, Nokia Shanghai Bell, Huawei, ZTE, Samsung

**Agenda item:** 21.2

**Document Type:** Discussion and decision

# 1. Introduction

This TP reflects the following agreements:

* For SN-terminated bearer, the MN provide the ECN Marking or Congestion Information Reporting Request per QoS flow to SN via the PDU Session Resource Setup Info – SN terminated IE, and PDU Session Resource Modification Info – SN terminated IE.
* For status (i.e. ECN Marking or Congestion Information Reporting Status) reported from SN to MN,
  + For SN-terminated SCG bearer, add an IE includes a list of items. Each item includes a DRB ID, and a list of QoS flows for SN-terminated SCG bearer mapped to the DRB, and the status for the DRB.
  + For other SN-terminated bearer, add status per DRB.

# 2. TP to TS38.423

-------------------------------------- CHANGES START HERE --------------------------------------

## 8.3 Procedures for Dual Connectivity

### 8.3.1 S-NG-RAN node Addition Preparation

#### 8.3.1.1 General

The purpose of the S-NG-RAN node Addition Preparation procedure is to request the S-NG-RAN node to allocate resources for dual connectivity operation for a specific UE. Possible parallel requests are identified by the PCell ID when the source UE AP IDs are the same.

The procedure uses UE-associated signalling.

#### 8.3.1.2 Successful Operation



Figure 8.3.1.2-1: S-NG-RAN node Addition Preparation, successful operation

The M-NG-RAN node initiates the procedure by sending the S-NODE ADDITION REQUEST message to the S-NG-RAN node.

When the M-NG-RAN node sends the S-NODE ADDITION REQUEST message, it shall start the timer TXnDCprep.

The allocation of resources according to the values of the *Allocation and Retention Priority* IE included in the *QoS Flow Level QoS Parameters* IE for each QoS flow shall follow the principles specified for the PDU Session Resource Setup procedure in TS 38.413 [5].

The S-NG-RAN node shall choose the ciphering algorithm based on the information in the *UE Security Capabilities* IE and locally configured priority list of AS encryption algorithms and apply the key indicated in the *S-NG-RAN node Security Key* IE as specified in TS 33.501 [28].

If the *TSC Traffic Characteristics* IE is included for a QoS flow in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [5].

If the *Additional QoS* *Flow Information* IE is included for a QoS flow in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [5].

For each GBR QoS flow, if the *Alternative QoS Parameters Set List* IE is included in the *GBR QoS Flow Information* IE, the S-NG-RAN node shall, if supported, behave the same as the NG-RAN node in the PDU Session Resource Setup procedure specified in TS 38.413 [5].

For each PDU session, if the *Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE contained in the *PDU Session Resources To Be Added List* IE and the *Common Network Instance* IE is not present, the S-NG-RAN node shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [7].

For each GBR QoS flow, if the *Offered GBR QoS Flow Information* IE is included in the *QoS Flows To Be Setup List* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE, the S-NG-RAN node may request the M-NG-RAN node to configure the DRB to which that QoS flow is mapped with MCG resources.

For each PDU session, if the *Non-GBR Resources Offered* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE contained in the *PDU Session Resources To Be Added List* IE and set to "true", the S-NG-RAN node may request the M-NG-RAN node to configure DRBs to which non-GBR QoS flows of the PDU session are mapped with MCG resources.

For each PDU session, if the *Common* *Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE contained in the *PDU Session Resources To Be Added List* IE, the S-NG-RAN node shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [7].

Redundant transmission:

- For each PDU session, if the *Redundant UL NG-U UP TNL Information at UPF* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE, the S-NG-RAN node shall, if supported, use it as the uplink termination point for the user plane data for this PDU session for the redundant transmission and it shall include the *Redundant DL NG-U UP TNL Information at NG-RAN* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE as described in TS 23.501 [7].

- For each PDU session, if the *Redundant Common Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE the S-NG-RAN node shall, if supported, use it when selecting transport network resource for the redundant transmission as specified in TS 23.501 [7].

- For each PDU session for which the *Redundant QoS Flow Indicator* IE is include in *QoS Flows To Be Setup List* IE contained in the *S-NODE ADDITION REQUEST* message, the S-NG-RAN node shall, if supported, store and use it as specified in TS 23.501 [7].

- For each PDU session, if the *Redundant PDU Session Information* IE is included in the *PDU Session Resource Setup Info - SN terminated* IE in the S-NODE ADDITION REQUEST message, the S-NODE-RAN node shall, if supported, store the received information in the UE context and setup the redundant user plane resources for the concerned PDU session, as specified in TS 23.501 [7].

- For each PDU session resource successfully setup for which the *Redundant PDU Session Information* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, include the *Used RSN Information* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message. If the *PDU Session Pair ID* IE is included in the *Redundant PDU Session Information* IE, the S-NG-RAN node may store and use it to identify the paired PDU sessions.

If the S-NODE ADDITION REQUEST message contains the *Selected PLMN* IE, the S-NG-RAN node may use it for RRM purposes. If the S-NODE ADDITION REQUEST message also contains the *Selected NID* IE, the S-NG-RAN node may decide to use the SNPN identified by the *Selected PLMN* IE and *Selected NID* IE for its own usage.

If the S-NODE ADDITION REQUEST message contains the *Expected UE Behaviour* IE, the S-NG-RAN node shall, if supported, store this information and may use it to optimize resource allocation.

If the S-NODE ADDITION REQUEST message contains the *Mobility Restriction List* IE, the S-NG-RAN node, if supported, shall store this information and use it to select an appropriate SCG.

If the S-NODE ADDITION REQUEST message contains the *Index to RAT/Frequency Selection Priority* IE, the S-NG-RAN node may use it for RRM purposes.

If the S-NG-RAN node is a gNB and the S-NODE ADDITION REQUEST message contains the *PCell ID* IE, the S-NG-RAN node shall search for the target NR cell among the NR neighbour cells of the PCell indicated, as specified in the TS 37.340 [8].

If the S-NODE ADDITION REQUEST message contains the *S-NG-RAN node PDU Session Aggregate Maximum Bit Rate* IE, the S-NG-RAN node may use it for RRM purposes.

If the S-NODE ADDITION REQUEST message contains the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node should forward it to lower layers and it may use it for the purpose of resource coordination with the M-NG-RAN node, or to coordinate with sidelink resources used in the M-NG-RAN node. The S-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The S-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node shall, if supported, use the information to determine further coordination of resource utilisation between the S-NG-RAN node and the M-NG-RAN node.

If the S-NODE ADDITION REQUEST message contains the *NE-DC TDM Pattern* IE, the S-NG-RAN node should forward it to lower layers and use it for the purpose of single uplink transmission. The S-NG-RAN node shall consider the value of the received *NE-DC TDM Pattern* IE valid until reception of a new update of the IE for the same UE.

If the S-NODE ADDITION REQUEST message contains the *QoS Flow Mapping Indication* IE, the S-NG-RAN node may take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

For each bearer for which allocation of the PDCP entity is requested at the S-NG-RAN node:

- the M-NG-RAN node may propose to apply forwarding of downlink data by including the *DL Forwarding* IE within *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message. For each bearer that it has decided to admit, the S-NG-RAN node may include the *DL Forwarding GTP Tunnel Endpoint* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE of the S-NODE ADDITION REQUEST ACKNOWLEDGE message to indicate that it accepts the proposed forwarding of downlink data for this bearer.

- the S-NG-RAN node may include for each bearer in the *PDU Session Resource Setup Response Info – SN terminated* IE the *UL Forwarding GTP Tunnel Endpoint* IE to indicates it request data forwarding of uplink packets to be performed for that bearer.

- the M-NG-RAN node shall include *RLC Mode* IE for each bearer offloaded from M-NG-RAN node to S-NG-RAN node in the *DRBs to QoS Flow Mapping List* IE within the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDTION REQUEST message, and the *RLC Mode* IE indicates the mode that the M-NG-RAN used for the DRB when it was hosted at the M-NG-RAN node.

For each bearer for which the PDCP entity is at the M-NG-RAN node:

- the M-NG-RAN node shall include the *RLC mode* IE for each bearer in the *DRBs To Be Setup List* IE within the *PDU Session Resource Setup Info – MN terminated* IE of the S-NODE ADDTION REQUEST message to indicate the RLC mode has been configured at the M-NG-RAN node, so that the S-NG-RAN node shall configure the same RLC mode for this MN terminated split bearer.

The M-NG-RAN node may also propose to apply forwarding of UL data when offloading QoS flows for which in-order delivery is requested by including the *UL Forwarding* *Proposal* IE in the *Data Forwarding and Offloading Info from source NG-RAN node* IE within the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message. The S-NG-RAN node may include the *PDU Session level UL data Forwarding UP TNL Information* IE in the *Data Forwarding Info from target NG-RAN node* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE of the S-NODE ADDITION REQUEST ACKNOWLEDGE message to indicate that it accepts the proposed forwarding.

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

If the *UE Radio Capability ID* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [7] and TS 23.502 [13].

The S-NG-RAN node shall report to the M-NG-RAN node, in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the result for all the requested PDU session resources in the following way:

- A list of PDU session resources which are successfully established shall be included in the *PDU Session Resources Admitted To Be Added List* IE.

- A list of PDU session resources which failed to be established shall be included in the *PDU Session Resources Not Admitted List* IE.

Upon reception of the S-NODE ADDITION REQUEST ACKNOWLEDGE message the M-NG-RAN node shall stop the timer TXnDCprep.

If the S-NODE ADDITION REQUEST ACKNOWLEDGE message contains the *MR-DC Resource Coordination Information* IE, the M-NG-RAN node may use it for the purpose of resource coordination with the S-NG-RAN node. The M-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The M-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the M-NG-RAN node shall, if supported, use the information to determine further coordination of resource utilisation between the M-NG-RAN node and the S-NG-RAN node.

The S-NG-RAN node may include for each bearer in the *DRBs To Be Setup List* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message the *PDCP SN Length* IE to indicate the PDCP SN length for that DRB.

If the *S-NG-RAN node UE XnAP ID* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as defined in TS 37.340 [8].

If the S-NODE ADDITION REQUEST message contains the *PDCP SN Length* IE, the S-NG-RAN node shall, if supported, store this information and use it for lower layer configuration of the concerned MN terminated bearer.

If the S-NODE ADDITION REQUEST message contains the *SN Addition Trigger Indication* IE, the S-NG-RAN node shall include the *RRC config indication* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message to inform the M-NG-RAN node if the S-NG-RAN node applied full or delta configuration, as specified in TS 37.340 [8].

If the S-NODE ADDITION REQUEST message contains the *S-NG-RAN node Maximum Integrity Protected Data Rate* *Uplink* IE or the *S-NG-RAN node Maximum Integrity Protected Data Rate Downlink* IE, the S-NG-RAN node shall use the received information when enforcing the maximum integrity protected data rate for the UE.

If the *Security Indication* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message, the behaviour of the S-NG-RAN node shall be the same as specified for the same IE in the *PDU Session Resources To Be Setup List* IE in the Handover Preparation procedure, for the concerned PDU session, and the S-NG-RAN node shall include the *Security Result* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE. If either the S-NG-RAN node or the M-NG-RAN node is an ng-eNB, the S-NG-RAN node shall behave as specified in TS 33.501 [28].

If the *Security Result* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message, the S-NG-RAN node may take the information into account when deciding whether to perform user plane integrity protection or ciphering for the DRBs that it establishes for the concerned PDU session, except if the *Split Session Indicator* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE and set to "split", in which case it shall perform user plane integrity protection or ciphering according to the information in the *Security Result* IE*.*

The S-NG-RAN node may include the *Location Information at S-NODE* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, if respective information is available at the S-NG-RAN node.

If the *Location Information at S-NODE reporting* IE set to "pscell" is included in the S-NODE ADDITION REQUEST, the S-NG-RAN node shall, start providing information about the current location of the UE. If the *Location Information at S-NODE* IE is included in the S-NODE ADDITION REQUEST ACKNOWLEDGE, the M-NG-RAN node shall store the included information so that it may be transferred towards the AMF.

If the *Default DRB Allowed* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message and set to "true", the S-NG-RAN node may configure the default DRB for the PDU session.

If the S-NODE ADDITION REQUEST ACKNOWLEDGE message includes the *DRB IDs taken into use* IE, the M-NG-RAN node, if applicable, shall act as specified in TS 37.340 [8].

If *Trace Activation* IE has previously been received for this UE, it shall be included in the S-NODE ADDITION REQUEST message. If the *Trace Activation* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, initiate the requested trace function as described in TS 32.422 [23].

If the *Trace Activation* IE is included in the S-NODE ADDITION REQUEST message which includes

- the *MDT Activation* IE set to "Immediate MDT and Trace", then the S-NG-RAN node shall if supported, initiate the requested trace session and MDT session as described in TS 32.422 [23].

- the *MDT Activation* IE set to "Immediate MDT Only", the S-NG-RAN node shall, if supported, initiate the requested MDT session as described in TS 32.422 [23] and the S-NG-RAN node shall ignore the *Interfaces To Trace* IE, and the *Trace Depth* IE.

- the *MDT Location Information* IE, within the *MDT Configuration* IE, the S-NG-RAN node shall, if supported, store this information and take it into account in the requested MDT session.

- the *MDT Activation* IE set to "Immediate MDT Only", and if the *Signalling based MDT PLMN List* IE is included in the *MDT Configuration* IE, the S-NG-RAN node may use it to propagate the MDT Configuration as described in TS 37.320 [43].

- the *Bluetooth Measurement Configuration* IE, within the *MDT Configuration* IE, the S-NG-RAN node shall, if supported, take it into account for MDT Configuration as described in TS 37.320 [43].

- the *WLAN Measurement Configuration* IE, within the *MDT Configuration* IE, the S-NG-RAN node shall, if supported, take it into account for MDT Configuration as described in TS 37.320 [43].

- the *Sensor Measurement Configuration* IE, within the *MDT Configuration* IE, the S-NG-RAN node shall take it into account for MDT Configuration as described in TS 37.320 [43].

- the *MDT Configuration* IE and if the S-NG-RAN node is a gNB at least *the MDT Configuration-NR* IE shall be present, while if the S-NG-RAN Node is an ng-eNB at least the *MDT Configuration-EUTRA* IE shall be present.

If the *Area Scope* IE is not present in the *MDT Configuration* IE, the S-NG-RAN node shall consider that the MDT Configuration is applied to all PLMNs indicated in the MDT PLMN List, as described in TS 32.422 [23].

If the *Requested Fast MCG recovery via SRB3* IE set to "true" is included in the S-NODE ADDITION REQUEST message and the S-NG-RAN node decides to configure fast MCG link recovery via SRB3 as specified in TS 37.340 [8], the S-NG-RAN node shall, if supported, include the *Available fast MCG recovery via SRB3* IE set to "true" in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If the *QoS Monitoring Request* IE is included in the *QoS Flow Level QoS Parameters* IE for a QoS flow contained in the *DRBs To Be Setup List* IE of the *PDU Session Resource Setup Info – MN terminated* IE, the S-NG-RAN node shall, if supported, use it to configure lower layers for the purpose of delay measurement and QoS monitoring as specified in TS 23.501 [7]. If the *QoS Monitoring Reporting Frequency* IE is included in the *QoS Flow Level QoS Parameters* IE for a QoS flow contained in the *DRBs To Be Setup List* IE of the *PDU Session Resource Setup Info – MN terminated* IE, the S-NG-RAN node shall, if supported, use it for RAN part delay reporting.

For each QoS flow which has been successfully established in the S-NG-RAN node, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE, the S-NG-RAN node shall store this information, and shall, if supported, perform delay measurement and QoS monitoring as specified in TS 23.501 [7]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE, the S-NG-RAN node shall store this information, and shall, if supported, use it for RAN part delay reporting. In case such a QoS flow is included in the *DRBs To Be Setup List* IE of the *PDU Session Resource Setup Response Info – SN terminated* IE, the M-NG-RAN node shall, if supported, use it to configure lower layers for the purpose of delay measurement and QoS monitoring. If the *QoS Monitoring Reporting Frequency* IE is included in the *DRBs To Be Setup List* IE of the *PDU Session Resource Setup Response Info – SN terminated* IE, the M-NG-RAN node shall, if supported, use it for RAN part delay reporting.

For each DRB configured as MN-terminated split bearer/SCG bearer, if the *QoS Mapping Information* IE is included in the *DRBs Admitted List* IE in the *PDU Session Resource Setup Response Info – MN terminated* IE of the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it to set DSCP and/or IPv6 flow label fields for the downlink IP packets which are transmitted from M-NG-RAN node to S-NG-RAN node through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

If the *Source NG-RAN Node ID* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, use it to decide the direct data path availability with the indicated source NG-RAN node, and if the direct data forwarding path is available, include the *Direct Forwarding Path Availability* IE set to "direct path available" in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If for a given QoS Flow the *Source DL Forwarding IP Address* IE or both, the *Source DL Forwarding IP Address* IEand the *Source Node DL Forwarding IP Address* IE are included within the *Data Forwarding and* *Offloading Info from source NG-RAN node* IE in the *PDU Session Resource Setup Info – SN terminated* IE contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If for a given QoS Flow the *Source DL Forwarding IP Address* IE is included within the *QoS Flows Mapped To DRB List* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE contained in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality to identify source TNL address for data forwarding in case of subsequent handover preparation, if such ACL functionality is deployed.

If the *Management Based MDT PLMN List* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store the received information in the UE context, and use this information to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [23].

Upon reception of the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, start collecting SCG information and continue for as long as the UE stays in one of its cells.

If the *UE History Information* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information.

If the *UE History Information from the UE* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information.

If the *PSCell Change History* IE set to "reporting full history" is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, signal the latest SCG UE History Information upon each PSCell change, to the M-NG-RAN node, using the S-NG-RAN node initiated S-NG-RAN node Modification procedure.

If the *IAB Node Indication* IE set to "true" is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, consider that dual connectivity operation is requested for an IAB-node. In addition:

- If the *No PDU Session Indication* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, consider the UE as an IAB-node which does not have any PDU sessions activated, and ignore the *PDU Session Resources To Be Added List* IE, and shall not take any action with respect to PDU session setup. Subsequently, the M-NG-RAN node shall, if supported, ignore the *PDU Session Resources Admitted To Be Added List* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

- If the *F1-terminating IAB-donor Indicator* IE set to "true" is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, assume that it will become the F1-terminating IAB-donor of the IAB-node, and act as described in TS 38.401 [2].

If the *CHO Information SN Addition* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall consider that the S-NG-RAN node Addition Preparation procedure has been triggered as part of a conditional handover. It may use the *Source M-NG-RAN node ID* IE and the *Source M-NG-RAN node UE XnAP ID* IE to identify other active S-NG-RAN node Addition Preparations related to this UE. If the *PCell ID* IE is also included in the S-NODE ADDITION REQUEST message, then the S-NG-RAN node shall, if supported, include the *PCell ID* IE within the *CHO Information SN Addition Acknowledge* IE of the S-NODE ADDITION REQUEST ACKNOWLEDGE message. If the *Estimated Arrival Probability* IE is contained in the *CHO Information SN Addition* IE included in the S-NODE ADDITION REQUEST message, then the S-NG-RAN node may use the information to allocate necessary resources for the UE. If the *Direct Forwarding Path Availability with source M-NG-RAN node* IE set to "direct path available" is included in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, consider that the direct forwarding path is available between the target S-NG-RAN node and the source M-NG-RAN node.

If the *SCG Activation Request* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node may use it to configure SCG resources as specified in TS 37.340 [8], and shall, if supported, include the *SCG Activation Status* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message. If the *SCG Activation Request* IE in the S-NODE ADDITION REQUEST message is set to "Activate SCG", the S-NG-RAN node shall, if supported, activate the SCG resources and set the *SCG Activation Status* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message to "SCG activated".

If the *Conditional PSCell Addition Information Request* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, consider that the request concerns CPAC, as described in TS 37.340 [8]. Accordingly, the S-NG-RAN node shall, if supported, include the *Conditional PSCell Addition Information Acknowledge* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If *the S-CPAC Request Information* IE is contained in the *Conditional PSCell Addition Information Request* IE included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, consider that the procedure is triggered for S-CPAC preparation. If the S-NG-RAN node accepts the request as a S-CPAC preparation, it shall include the *Candidate PSCell with Other Information List* IE in the *Conditional PSCell Addition Information Acknowledge* IE.

If the *S-CPAC Reference Configuration Request* IE set to "request" is contained in the *Conditional PSCell Addition Information Request* IE included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, provide the SCG reference configuration for S-CPAC.

If the *S-CPAC Multiple Target S-NG-RAN Node List* IE is contained within the *S-CPAC Request Information* IE in the *Conditional PSCell Addition Information Request* IE included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, consider that the information pertains to a list of PSCells suggested for other candidate SN(s) may also be prepared for S-CPAC, and act as described in TS 37.340 [8].

If the *Conditional PSCell Addition Information Acknowledge* IE is included in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, consider the indicated PSCells are selected by the target SN as candidate PSCells for CPAC.

If the S-NG-RAN node applied a complete configuration for a specific PSCell, e.g., as part of preparation of S-CPAC, the S-NG-RAN node shall inform the M-NG-RAN node by including the *S-CPAC Complete Configuration Indicator* IE in the *Candidate PSCell with Other Information Item* IE in the *Conditional PSCell Addition Information Acknowledge* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If the *CG-CandidateList* is included in the *S-NG-RAN node to M-NG-RAN node Container* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it for the purpose of CPAC.

If the *Estimated Arrival Probability* IE is contained in the *Conditional PSCell Addition Information Request* IE included in the S-NODE ADDITION REQUEST message, then the candidate target S-NG-RAN node may use the information to allocate necessary resources for the incoming CPAC procedure.

If the *S-NG-RAN node UE Slice Maximum Bit Rate* IE for a specific S-NSSAI is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store and use the received S-NG-RAN node UE Slice Maximum Bit Rate for all PDU sessions associated with the S-NSSAI for the concerned UE as defined in TS 23.501 [7].

If the S-NODE ADDITION REQUEST ACKNOWLEDGE message includes the *SN Mobility Information* IE, the M-NG-RAN node shall, if supported, store this information and use it as defined in TS 37.340 [8].

If the *QMC Coordination Request* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node may use it as specified in TS 37.340 [8], and shall, if supported, include the *QMC Coordination Response* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If the *Source SN to Target SN QMC Information* IE is contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, use it for QoE measurements handling, as specified in TS 37.340 [8].

If the *Source M-NG-RAN node ID* IE is included in the S-NODE ADDITION REQUEST message, the S-NG-RAN node may use it to deduce direct data path availability with the source M-NG-RAN node, and if the direct data forwarding path is available, may include the *Direct Forwarding Path Availability with source M-NG-RAN node* IE in the S-NODE ADDITION REQUEST ACKNOWLEDGE message.

If the S-NODE ADDITION REQUEST message contains the *IAB Authorization status* IE, the S-NG-RAN node shall, if supported, store it and use it as defined in TS 38.401[2].

For each QoS flow, if the *PDU Set QoS Parameters* IE is included in the *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as specified in TS 23.501 [7].

For each DRB configured as MN-terminated SCG bearer, if the *PDU Set QoS Parameters* IE is included in the *DRB QoS* IE in the *PDU Session Resource Setup Info – MN terminated* IE of the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as specified in TS 23.501 [7].

For each DRB configured as MN-terminated SCG bearer, if the *ECN Marking or Congestion Information Reporting Request* IE is included in the *PDU Session Resource Setup Info – MN terminated* IE contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, use it accordingly for the specific DRB. If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *PDU Session Resource Setup Response Info – MN terminated* IE, the M-NG-RAN node shall, if supported, use it to deduce if ECN marking or congestion information reporting is active or not active.

For each QoS flow for which the *ECN Marking or Congestion Information Reporting Request* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE contained in the S-NODE ADDITION REQUEST message, the S-NG-RAN node shall, if supported, use it accordingly for the specific QoS flow.

If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *PDU Session Resource Setup Response Info – SN terminated* IE, contained in the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.

**Interactions with the S-NG-RAN node Reconfiguration Completion procedure:**

If the S-NG-RAN node admits at least one PDU session resource, the S-NG-RAN node shall start the timer TXnDCoverall when sending the S-NODE ADDITION REQUEST ACKNOWLEDGE message to the M-NG-RAN node except for a request for conditional configuration. The reception of the S-NODE RECONFIGURATION COMPLETE message shall stop the timer TXnDCoverall if TXnDCoverall is running.

**Interaction with the Activity Notification procedure**

Upon receiving an S-NODE ADDITION REQUEST message containing the *Desired Activity Notification Level* IE, the S-NG-RAN node shall, if supported, use this information to decide whether to trigger subsequent Activation Notification procedures according to the requested notification level.

#### 8.3.1.3 Unsuccessful Operation



Figure 8.3.1.3-1: S-NG-RAN node Addition Preparation, unsuccessful operation

If the S-NG-RAN node is not able to accept any of the bearers or a failure occurs during the S-NG-RAN node Addition Preparation, the S-NG-RAN node sends the S-NODE ADDITION REQUEST REJECT message with an appropriate cause value to the M-NG-RAN node.

If the *CHO Information SN Addition* IE is included in the S-NODE ADDITION REQUEST message and the *PCell ID* IE is also included, but the S-NG-RAN node is not able to accept any of the bearers or a failure occurs during the S-NG-RAN node Addition Preparation, the S-NG-RAN node shall, if supported, include the *PCell ID* IE in the S-NODE ADDITION REQUEST REJECT message.

#### 8.3.1.4 Abnormal Conditions

If the S-NG-RAN node receives an S-NODE ADDITION REQUEST message containing in a *PDU Session Resources To Be Added Item* IE neither the *PDU Session Resource Setup Info – SN terminated* IE nor the *PDU Session Resource Setup Info – MN terminated* IE, the S-NG-RAN node shall fail the S-NG-RAN node Addition Preparation procedure indicating an appropriate cause.

If the supported algorithms for encryption defined in the *NR* *Encryption Algorithms* IE in the *NR* *UE Security Capabilities* IE, plus the mandated support of NEA0 in all UEs (TS 33.501 [28]), do not match any algorithms defined in the configured list of allowed encryption algorithms in the S-NG-RAN node (TS 33.501 [28]), the S-NG-RAN node shall reject the procedure using the S-NODE ADDITION REQUEST REJECT message.

If the supported algorithms for integrity defined in the *NR Integrity Protection Algorithms* IE in the *NR* *UE Security Capabilities* IE do not match any algorithms defined in the configured list of allowed integrity protection algorithms in the S-NG-RAN node (TS 33.501 [28]), the S-NG-RAN node shall reject the procedure using the S-NODE ADDITION REQUEST REJECT message.

If the S-NG-RAN node receives an S-NODE ADDITION REQUEST message containing a *S-NG-RAN node UE XnAP ID* IE that does not match any existing UE Context that has such ID, the S-NG-RAN node shall reject the procedure using the S-NODE ADDITION REQUEST REJECT message.

If the M-NG-RAN node receives an S-NODE ADDITION REQUEST ACKNOWLEGE message containing a value for the *PDU Session ID* in the *PDU Session Resources Admitted To Be Added List* IE and in *PDU Session Resources Not Admitted List* IE, the M-NG-RAN node shall regard setup of S-NG-RAN node resources of that PDU Session as being failed.

If the S-NG-RAN node receives an S-NODE ADDITION REQUEST message containing, for a PDU session, a *PDU Session Resource Setup Info – SN terminated* IE for which the *Split Session Indicator* IE is included and set to "split", the *Security Result* IE is not included, and either the *Integrity Protection Indication* IE or the *Confidentiality Protection Indication* IE is set to "preferred", it shall reject the PDU session.

**Interaction with the M-NG-RAN node initiated S-NG-RAN node Release procedure:**

If the M-NG-RAN node receives an S-NODE ADDITION REQUEST ACKNOWLEDGE message containing in a *PDU Session Resource Admitted To Be Added Item* IE neither the *PDU Session Resource Setup Response Info – SN terminated* IE nor the *PDU Session Resource Setup Response Info – MN terminated* IE, the M-NG-RAN node shall trigger the M-NG-RAN node initiated S-NG-RAN node Release procedure indicating an appropriate cause.

If the timer TXnDCprep expires before the M-NG-RAN node has received the S-NODE ADDITION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall regard the S-NG-RAN node Addition Preparation procedure as being failed and shall trigger the M-NG-RAN node initiated S-NG-RAN node Release procedure.

**Interactions with the S-NG-RAN node Reconfiguration Completion and S-NG-RAN node initiated S-NG-RAN node Release procedure:**

If the timer TXnDCoverall expires before the S-NG-RAN node has received the S-NODE RECONFIGURATION COMPLETE or the S-NODE RELEASE REQUEST message, the S-NG-RAN node shall regard the requested RRC connection reconfiguration as being not applied by the UE and shall trigger the S-NG-RAN node initiated S-NG-RAN node Release procedure.

-------------------------------------- NEXT CHANGE --------------------------------------

### 8.3.3 M-NG-RAN node initiated S-NG-RAN node Modification Preparation

#### 8.3.3.1 General

This procedure is used to enable an M-NG-RAN node to request an S-NG-RAN node to either modify the UE context at the S-NG-RAN node or to query the current SCG configuration for supporting delta signalling in M-NG-RAN node initiated S-NG-RAN node change, or to provide the S-RLF-related information to the S-NG-RAN node.

The procedure uses UE-associated signalling.

#### 8.3.3.2 Successful Operation



Figure 8.3.3.2-1: M-NG-RAN node initiated S-NG-RAN node Modification Preparation, successful operation

The M-NG-RAN node initiates the procedure by sending the S-NODE MODIFICATION REQUEST message to the S-NG-RAN node.

When the M-NG-RAN node sends the S-NODE MODIFICATION REQUEST message, it shall start the timer TXnDCprep.

The S-NODE MODIFICATION REQUEST message may contain

- within the *UE Context Information* IE;

- PDU session resources to be added within the *PDU Session Resources To Be Added Item* IE;

- PDU session resources to be modified within the *PDU Session Resources To Be Modified Item* IE;

- PDU session resources to be released within the *PDU Session Resources To Be Released Item* IE;

- the *S-NG-RAN node Security Key* IE;

- the *S-NG-RAN node UE Aggregate Maximum Bit Rate* IE;

- the *M-NG-RAN node to S-NG-RAN node Container* IE;

- the *PDCP Change Indication* IE;

- the *SCG Configuration Query* IE;

- the *Requested split SRBs IE*;

- the *Requested split SRBs release* IE;

- the *Requested fast MCG recovery via SRB3 IE*;

- the *Requested fast MCG recovery via SRB3 Release* IE;

- the *Additional DRB IDs* IE;

- the *MR-DC Resource Coordination Information* IE.

If the S-NODE MODIFICATION REQUEST message contains the *Selected PLMN* IE, the S-NG-RAN node may use it for RRM purposes. If the S-NODE MODIFICATION REQUEST message also contains the *Selected NID* IE, the S-NG-RAN node may decide to use the SNPN identified by the *Selected PLMN* IE and *Selected NID* IE for its own usage.

If the S-NODE MODIFICATION REQUEST message contains the *Mobility Restriction List* IE, the S-NG-RAN node shall

- replace the previously provided Mobility Restriction List by the received Mobility Restriction List in the UE context;

- use this information to select an appropriate SCG.

If the *S-NG-RAN node UE Aggregate Maximum Bit Rate* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall:

- replace the previously provided S-NG-RAN node UE Aggregate Maximum Bit Rate by the received S-NG-RAN node UE Aggregate Maximum Bit Rate in the UE context;

- use the received S-NG-RAN node UE Aggregate Maximum Bit Rate for Non-GBR Bearers for the concerned UE as defined in TS 37.340 [8].

If the *S-NG-RAN node UE Slice Maximum Bit Rate* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported:

- store and replace the previously provided S-NG-RAN node UE Slice Maximum Bit Rate, if any, by the received S-NG-RAN node UE Slice Maximum Bit Rate for each S-NSSAI for the concerned UE;

- use the received S-NG-RAN node UE Slice Maximum Bit Rate for all PDU sessions associated with the S-NSSAI for the concerned UE as defined in TS 23.501 [7].

If the S-NODE MODIFICATION REQUEST message contains the *Index to RAT/Frequency Selection Priority* IE, the S-NG-RAN node may use it for RRM purposes.

If the S-NODE MODIFICATION REQUEST message contains the *S-NG-RAN node PDU Session Aggregate Maximum Bit Rate* IE, the S-NG-RAN node may use it for RRM purposes.

If the S-NODE MODIFICATION REQUEST message contains the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node should forward it to lower layers and it may use it for the purpose of resource coordination with the M-NG-RAN node, or to coordinate with sidelink resources used in the M-NG-RAN node. The S-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The S-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node shall, if supported, use the information to determine further coordination of resource utilisation between the S-NG-RAN node and the M-NG-RAN node.

If the S-NODE MODIFICATION REQUEST message contains the *NE-DC TDM Pattern* IE, the S-NG-RAN node should forward it to lower layers and use it for the purpose of single uplink transmission. The S-NG-RAN node shall consider the value of the received *NE-DC TDM Pattern* IE valid until reception of a new update of the IE for the same UE.

The allocation of resources according to the values of the *Allocation and Retention Priority* IE included in the *QoS Flow Level QoS Parameters* IE for each QoS flow shall follow the principles specified for the PDU Session Resource Setup procedure in TS 38.413 [5].

If the *Additional QoS* *Flow Information* IE is included for a QoS flow in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [5].

For each GBR QoS flow, if the *Alternative QoS Parameters Set List* IE is included in the *GBR QoS Flow Information* IE, the S-NG-RAN node shall, if supported, behave the same as the NG-RAN node in the PDU Session Resource Setup procedure specified in TS 38.413 [5].

If the *TSC Traffic Characteristics* IE is included for a QoS flow in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [5].

For each PDU session, if the *Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE and in the *PDU Session Resource Modification Info – SN terminated* IE and the *Common Network Instance* IE is not present, the S-NG-RAN node shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [7].

For each PDU session, if the *Common* *Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE and in the *PDU Session Resource Modification Info – SN terminated* IE, the S-NG-RAN node shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [7].

For each GBR QoS flow, if the *Offered GBR QoS Flow Information* IE is included in the *QoS Flows To Be Setup List* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE, the S-NG-RAN node may request the M-NG-RAN node to configure the DRB to which that QoS flow is mapped with MCG resources.

For each PDU session, if the *Non-GBR Resources Offered* IE is included in the *PDU Session Resource Modification Info – SN terminated* IE contained in the *PDU Session Resources To Be Added List* IE and set to "true", the S-NG-RAN node may request the M-NG-RAN node to configure the DRBs to which non-GBR QoS flows of the PDU session are mapped with MCG resources.

If at least one of the requested modifications is admitted by the S-NG-RAN node, the S-NG-RAN node shall modify the related part of the UE context accordingly and send the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message back to the M-NG-RAN node.

The M-NG-RAN node shall include *RLC Mode* IE for each bearer offloaded from M-NG-RAN node to S-NG-RAN node in the *DRBs to QoS Flow Mapping List* IE within the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, and the *RLC Mode* IE indicates the mode that the M-NG-RAN used for the DRB when it was hosted at the M-NG-RAN node.

The S-NG-RAN node shall include the PDU sessions for which resources have been either added or modified or released at the S-NG-RAN node either in the *PDU Session Resources Admitted To Be Added List* IE or the *PDU Session Resources Admitted To Be Modified List* IE or the *PDU Session Resources Admitted To Be Released List* IE. The S-NG-RAN node shall include the PDU sessions that have not been admitted in the *PDU Session Resources Not Admitted List* IE with an appropriate cause value.

If the M-NG-RAN node requests transfer of the PDCP hosting from the S-NG-RAN node to the M-NG-RAN node for a PDU session, in which case the S-NODE MODIFICATION REQUEST message contains an PDU session resource to be released which is configured with the SCG bearer option within the *PDU Session Resources To Be Released List* IE, the S-NG-RAN node shall include the *RLC Mode* IE within the *DRBs To Be Released List* IE in the *PDU Session Resources admitted to be released List – SN terminated* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message. The *RLC Mode* IE indicates the RLC mode that the S-NG-RAN node uses for the DRB.

If the *QoS Flow Mapping Indication* IE is included in the S-NODE MODIFICATION REQUEST message for a QoS flow to be modified, the S-NG-RAN node may replace and take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

If the S-NODE MODIFICATION REQUEST message contains for a PDU session resource to be modified which is configured with the SN terminated bearer option, the *UL NG-U UP TNL Information at UPF* IE the S-NG-RAN node shall use it as the new UL NG-U address.

If the S-NODE MODIFICATION REQUEST message contains for a PDU session resource to be modified which is configured with the MN terminated bearer option, the *MN UL PDCP UP TNL Information* IE the S-NG-RAN node shall use it as the new UL Xn-U address.

Redundant transmission:

- If the S-NODE MODIFICATION REQUEST message contains for a PDU session resource to be modified which is configured with the SN terminated bearer option, the *Redundant UL NG-U UP TNL Information at UPF* IE, the S-NG-RAN node shall, if supported, use it as the new UL NG-U address for the redundant transmission as specified in TS 23.501 [7].

- For each PDU session, if the *Redundant Common Network Instance* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE or in the *PDU Session Resource Modification Info – SN terminated* IE, the S-NG-RAN node shall, if supported, use it when selecting transport network resource for the redundant transmission as specified in TS 23.501 [7].

- For each PDU session, if the *Redundant QoS Flow Indicator* IE is set to false for all QoS flows, the S-NG-RAN node shall, if supported, stop the redundant transmission and release the redundant tunnel for the concerned PDU Session as specified in TS 23.501 [7].

- For each PDU session for which the *Redundant QoS Flow Indicator* IE is included in the *S-NODE MODIFICATION REQUEST* message, the S-NG-RAN node shall, if supported, store and use it as specified in TS 23.501 [7].

- For each PDU session, if the *Redundant PDU Session Information* IE is included in the *PDU Session Resource Setup Info - SN terminated* IE in the S-NODE MODIFICATION REQUEST message, the S-NODE-RAN node shall, if supported, store the received information in the UE context and setup the redundant user plane for the concerned PDU session, as specified in TS 23.501 [7]. If the *PDU Session Pair ID* IE is included in the *Redundant PDU Session Information* IE, the S-NG-RAN node may store and use it to identify the paired PDU sessions.

- For each PDU session resource successfully setup for which the *Redundant PDU Session Information* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, include the *Used RSN Information* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the S-NODE MODIFICATION REQUEST message contains the *QoS flows To Be Released List* within the *PDU Session Resource Modification Info – SN terminated* IE, the S-NG-RAN node may propose to apply forwarding of UL data for the QoS flows for which in-order delivery is requested by including the *UL Forwarding* *Proposal* IE in the *Data Forwarding and Offloading Info from source NG-RAN node* IE within the *PDU Session Resource Modification Response Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

For a PDU session resource to be modified which is configured with the SN terminated bearer option the S-NG-RAN node may include in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message the *DL NG-U UP TNL Information at NG-RAN* IE.

For a PDU session resource to be modified which is configured with the MN terminated bearer option the S-NG-RAN node may include in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message the *SN DL SCG UP TNL Information* IE.

If the *PDCP Change Indication* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall act as specified in TS 37.340 [8].

Upon reception of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message the M-NG-RAN node shall stop the timer TXnDCprep. If the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message has included the *S-NG-RAN node to M-NG-RAN node Container* IE, the M-NG-RAN node is then defined to have a Prepared S-NG-RAN node Modification for that Xn UE-associated signalling.

If the *SCG Configuration Query* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall provide corresponding radio configuration information within the *S-NG-RAN node to M-NG-RAN node Container* IE and may provide the corresponding data forwarding related information within the *PDU Session Resources with Data Forwarding List* IE as specified in TS 37.340 [8].

For each bearer for which allocation of the PDCP entity is requested at the S-NG-RAN node:

- if applicable, the M-NG-RAN node may propose to apply forwarding of downlink data by including the DL Forwarding IE within the PDU Session Resource Setup Info – SN terminated IE of the S-NODE MODIFICATION REQUEST message. For each bearer that it has decided to admit, the S-NG-RAN node may include the *DL Forwarding GTP Tunnel Endpoint* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message to indicate that it accepts the proposed forwarding of downlink data for this bearer.

- the S-NG-RAN node may include for each bearer in the PDU Session Resource Setup Response Info – SN terminated IE the UL Forwarding GTP Tunnel Endpoint IE to indicate it requests data forwarding of uplink packets to be performed for that bearer.

The M-NG-RAN node may propose to apply forwarding of UL data when offloading QoS flows for which in-order delivery is requested by including the *UL Forwarding Proposal* IE in the *Data Forwarding and Offloading Info from source NG-RAN node* IE within the *PDU Session Resource Setup Info – SN terminated* IE or *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message. The S-NG-RAN node may include the *PDU Session level UL data Forwarding UP TNL Information* IE in the *Data Forwarding Info from target NG-RAN node* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE or *PDU Session Resource Modification Response Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message to indicate that it accepts the proposed forwarding.

If the S-NODE MODIFICATION REQUEST message contains the *Requested Split SRBs* IE, the S-NG-RAN node may use it to add split SRBs. If the S-NODE MODIFICATION REQUEST message contains the *Requested Split SRBs* *release* IE, the S-NG-RAN node may use it to release split SRBs.

If the *Requested Fast MCG recovery via SRB3* IE set to "true" is included in the S-NODE MODIFICATION REQUEST message and the S-NG-RAN decides to configure fast MCG link recovery via SRB3 as specified in TS 37.340 [8], the S-NG-RAN node shall, if supported, include the *Available fast MCG recovery via SRB3* IE set to "true" in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message. If the *Requested Fast MCG recovery via SRB3 Release* IE set to "true" is included in the S-NODE MODIFICATION REQUEST message and the S-NG-RAN decides to release fast MCG link recovery via SRB3, the S-NG-RAN node shall, if supported, include the *Release fast MCG recovery via SRB3* IE set to "true" in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *Lower Layer presence status change* IE set to "release lower layers" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall act as specified in TS 37.340 [8].

If the *Lower Layer presence status change* IE set to "re-establish lower layers" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall act as specified in TS 37.340 [8].

If the *Lower Layer presence status change* IE set to "suspend lower layers" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall act as specified in TS 37.340 [8].

If the *Lower Layer presence status change* IE set to "resume lower layers" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall act as specified in TS 37.340 [8].

The M-NG-RAN node may include for each bearer in the *DRBs To Be Modified List* IE in the S-NODE MODIFICATION REQUEST message the *RLC Status* IE to indicate that RLC has been reestablished at the M-NG-RAN node and the S-NG-RAN node may trigger PDCP data recovery.

If the S-NODE MODIFICATION REQUEST message contains the *PDCP SN Length* IE in the *DRBs To Be Setup List* IE, the S-NG-RAN node shall, if supported, store this information and use it for lower layer configuration of the concerned MN terminated bearer.

If the *PDCP Duplication Configuration* IE in the *PDU Session Resource Modification Info – MN terminated* IE is contained in the S-NODE MODIFICATION REQUEST message and set to "configured", the S-NG-RAN node shall, if supported, add the RLC entity of secondary path and the RLC entity of all additional path(s) for the indicated DRB. And if the S-NODE MODIFICATION REQUEST message contains the *Duplication Activation* IE, the S-NG-RAN node shall, if supported, store this information and use it for the purpose of PDCP duplication.

If the S-NODE MODIFICATION REQUEST message contains *RLC Duplication Information* IE, the S-NG-RAN node shall, if supported, store this information and use it for the purpose of PDCP duplication for the indicated DRB with more than two RLC entities.

If the *PDCP Duplication Configuration* IE in the *PDU Session Resource Modification Info – MN terminated* IE is contained in the S-NODE MODIFICATION REQUEST message and set to "de-configured", the S-NG-RAN node shall, if supported, delete the RLC entity of secondary path and the RLC entity of all additional path(s) for the indicated DRB.

The S-NG-RAN node may include for each bearer in the *DRBs To Be Setup List* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message the *PDCP SN Length* IE to indicate the PDCP SN length for that DRB.

The S-NG-RAN node may include the *QoS Flow Mapping Indication* IE for a QoS flow in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message to indicate that only the uplink or downlink QoS flow is mapped to the DRB.

If the *Additional DRB* IDs IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall store this information and use it together with previously provided DRB IDs if any, for SN terminated bearers.

If the S-NODE MODIFICATION REQUEST message contains the *S-NG-RAN node Maximum Integrity Protected Data Rate Uplink* IE or the *S-NG-RAN node Maximum Integrity Protected Data Rate Downlink* IE, the S-NG-RAN node shall use the received information when enforcing the maximum integrity protected data rate for the UE.

If the *Security Indication* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, the behaviour of the S-NG-RAN node shall be the same as specified for the same IE in the *PDU Session Resources To Be Setup List* IE in the Handover Preparation procedure, for the concerned PDU session, and the S-NG-RAN node shall include the *Security Result* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE. If either the S-NG-RAN node or the M-NG-RAN node is an ng-eNB, the S-NG-RAN node shall behave as specified in TS 33.501 [28].

If the *Security Result* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node may take the information into account when deciding whether to perform user plane integrity protection or ciphering for the DRBs that it establishes for the concerned PDU session, except if the *Split Session Indicator* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE and set to "split", in which case it shall perform user plane integrity protection or ciphering according to the information in the *Security Result* IE*.*

The S-NG-RAN node may include the *Location Information at S-NODE* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, if respective information is available at the S-NG-RAN node.

If the *Location Information at S-NODE reporting* IE set to "pscell" is included in the S-NODE MODIFICATION REQUEST, the S-NG-RAN node shall start providing information about the current location of the UE. If the *Location Information at S-NODE* IE is included in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE, the M-NG-RAN node shall store the included information so that it may be transferred towards the AMF.

If the *S-NSSAI* IE is included in the *PDU Session Resources To Be Modified List* IE in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall replace the previously *S-NSSAI* IE by the received *S-NSSAI I*E.

If the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message contains the *MR-DC Resource Coordination Information* IE, the M-NG-RAN node may use it for the purpose of resource coordination with the S-NG-RAN node. The M-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The M-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the M-NG-RAN node shall, if supported, use the information to determine further coordination of resource utilisation between the M-NG-RAN node and the S-NG-RAN node.

If the S-NODE MODIFICATION REQUEST message contains the *PCell ID* IE, the S-NG-RAN node may search for the target cell among the neighbour cells of the PCell indicated, as specified in the TS 37.340 [8].

If the S-NG-RAN node applied a full configuration or delta configuration, e.g., as part of mobility procedure involving a change of DU, the S-NG-RAN node shall inform the M-NG-RAN node by including the *RRC config indication* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *Default DRB Allowed* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE or *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message and set to "true", the S-NG-RAN node may configure the default DRB for the PDU session.

If the *Default DRB Allowed* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE or *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message and set to "false", the S-NG-RAN node shall not configure the default DRB for the PDU session and the S-NG-RAN node shall reconfigure the default DRB into a normal DRB if it has configured the default DRB before.

If the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message includes the *DRB IDs taken into use* IE, the M-NG-RAN node, if applicable, shall act as specified in TS 37.340 [8].

If the *QoS Monitoring Request* IE is included in the *QoS Flow Level QoS Parameters* IE for a QoS flow contained in the *DRBs To Be Setup List* IE or the *DRBs To Be Modified List* IE within the *PDU Session Resource Setup Info – MN terminated* IE or the *PDU Session Resource Modification Info – MN terminated* IE, the S-NG-RAN node shall, if supported, use it to configure lower layers for the purpose of delay measurement and QoS monitoring as specified in TS 23.501 [7]. If the *QoS Monitoring Reporting Frequency* IE is included in the *QoS Flow Level QoS Parameters* IE for a QoS flow contained in the *DRBs To Be Setup List* IE or the *DRBs To Be Modified List* IE within the *PDU Session Resource Setup Info – MN terminated* IE or the *PDU Session Resource Modification Info – MN terminated* IE, the S-NG-RAN node shall, if supported, use it for RAN part delay reporting.

For each QoS flow which has been successfully added or modified in the S-NG-RAN node, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE or the *PDU Session Resource Modification Info – SN terminated* IE, the S-NG-RAN node shall store this information, and shall, if supported, perform delay measurement and QoS monitoring as specified in TS 23.501 [7]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the *PDU Session Resource Setup Info – SN terminated* IE or the *PDU Session Resource Modification Info – SN terminated* IE, the S-NG-RAN node shall store this information, and shall, if supported, use it for RAN part delay reporting. In case such a QoS flow is included in the *DRBs To Be Setup List* IE or the *DRBs To Be Modified List* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE or the *PDU Session Resource Modification Response Info – SN terminated* IE, the M-NG-RAN node shall, if supported, use it to configure lower layers for the purpose of delay measurement and QoS monitoring. If the *QoS Monitoring Reporting Frequency* IE is included in the *DRBs To Be Setup List* IE or the *DRBs To Be Modified List* IE within the *PDU Session Resource Setup Response Info – SN terminated* IE or the *PDU Session Resource Modification Response Info – SN terminated* IE, the M-NG-RAN node shall, if supported, use it for RAN part delay reporting.

If the *PDU Session Expected UE Activity Behaviour* IE is included in the *PDU Session Resources To Be Added List* IE or the *PDU Session Resources To Be Modified List* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, use it for the concerned PDU session as specified in TS 23.501 [7].

If the M-NG-RAN node receives in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message within the *PDU Session Resource Modification Response Info –MN terminated* IE a DRBs Admitted to be Setup or Modified Item with DRB ID(s) that it has not requested to be setup or modified, the M-NG-RAN node shall ignore the contained information.

For each DRB configured as MN-terminated split bearer/SCG bearer, if the *QoS Mapping Information* IE is included in the *DRBs Admitted List* IE in the *PDU Session Resource Setup Response Info – MN terminated* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it to set DSCP and/or IPv6 flow label fields for the downlink IP packets which are transmitted from M-NG-RAN node to S-NG-RAN node through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

For each DRB configured as MN-terminated split bearer/SCG bearer, if the *QoS Mapping Information* IE is included in the *DRBs Admitted to be Setup or Modified List* IE in the *PDU Session Resource Modification Response Info – MN terminated* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it to set DSCP and/or IPv6 flow label fields for the downlink IP packets which are transmitted from M-NG-RAN node to S-NG-RAN node through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

For each DRB configured as SN-terminated split bearer/MCG bearer, if the *QoS Mapping Information* IE is included in the *DRBs To Be Modified List* IE in the *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, use it to set DSCP and/or IPv6 flow label fields for the downlink IP packets which are transmitted from S-NG-RAN node to M-NG-RAN node through the GTP tunnels indicated by the *UP Transport Layer Information* IE.

If the *Security Indication* IE is included in the *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, replace any existing security indication, and enable/disable ciphering or integrity protection as specified in TS 38.331 [10], for the concerned PDU session, and the S-NG-RAN node shall include the *Security Result* IE in the *PDU Session Resource Modification Response Info – SN terminated* IE. If either the S-NG-RAN node or the M-NG-RAN node is an ng-eNB, the S-NG-RAN node shall behave as specified in TS 33.501 [28].

If the *Target Node ID* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, include the *Direct Forwarding Path Availability* IE set to "direct path available" in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message if the direct forwarding path is available between the S-NG-RAN node and the indicated target node.

If the *PSCell History Information Retrieve* IE set to "query" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, use this information as specified in TS 37.340 [8].

If the *UE History Information from the UE* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, store this information.

If the *SCG UE History Information* IE is included in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use the information to update UE History Information with PSCell history.

If the *CHO Information SN Modification* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall consider that the M-NG-RAN node initiated S-NG-RAN node Modification Preparation procedure has been triggered as part of a conditional handover. If the *Estimated Arrival Probability* IE is contained in the *CHO Information SN Modification* IE included in the S-NODE MODIFICATION REQUEST message, then the S-NG-RAN node may use the information to allocate necessary resources for the UE.

If the *SCG Activation Request* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node may use it to configure SCG resources as specified in TS 37.340 [8], and shall, if supported, include the *SCG Activation Status* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *Conditional PSCell Change Information Update* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, consider that the request provides the list of PSCells prepared at the target S-NG-RAN node, as described in TS 37.340 [8].

If the *Conditional PSCell Addition Information Modification Request* IE is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, consider that the request concerns an update of the previous CPAC preparation or a subsequent CPAC if source SN is configured as a candidate SN, as described in TS 37.340 [8]. Accordingly, the S-NG-RAN shall, if supported, include the *Conditional PSCell Addition Information Modification Acknowledge* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *S-CPAC Request Information* IE is contained in the *Conditional PSCell Addition Information Modification Request* IE included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, consider that the procedure is triggered for S-CPAC preparation or modification.

If the S-NG-RAN node applied a complete configuration for a specific PSCell, e.g., as part of preparation or modification of S-CPAC, the S-NG-RAN node shall inform the M-NG-RAN node by including the *S-CPAC Complete Configuration Indicator* IE in the *Candidate PSCell with Other Information Item* IE in the *Conditional PSCell Addition Information Modification Acknowledge* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *S-CPAC Reference Configuration Request* IE set to "request" is contained in the *Conditional PSCell Addition Information Modification Request* IE included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, provide the SCG reference configuration for S-CPAC.

If the *S-CPAC Multiple Target S-NG-RAN Node List* IE is contained within the *S-CPAC Request Information* IE in the *Conditional PSCell Addition Information Modification Request* IE included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, consider that the information pertains to a list of PSCells suggested for other candidate SN(s) may also be prepared for S-CPAC, and act as described in TS 37.340 [8].

If the *S-CPAC Inter-SN Execution Notification* IE set to "executed" is contained in the *Conditional PSCell Addition Information Modification Request* IE included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, consider that the UE has been moved to another candidate SN due to inter-SN S-CPAC execution and may stop data transmission to the UE. If the *Data Forwarding and Offloading Info from source NG-RAN node* IE within the *PDU Session Resource Modification Info – SN terminated* IE is also included for some PDU session in the *PDU Session Resources To Be Modified List* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node may include the *Data Forwarding Info from target NG-RAN node* IE within the *PDU Session Resource Modification Response Info – SN terminated* IE of the corresponding PDU sessions in the *PDU Session Resources Admitted To Be Modified List* IE of the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message to provide the new data forwarding address information for S-CPAC.

If the *CG-CandidateList* is included in the *S-NG-RAN node to M-NG-RAN node Container* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it for the purpose of CPAC.

If the *Estimated Arrival Probability* IE is contained in the *Conditional PSCell Addition Information Modification Request* IE included in the S-NODE MODIFICATION REQUEST message, then the candidate target S-NG-RAN node may use the information to allocate necessary resources for the incoming CPAC procedure.

If for a given QoS Flow the *Source DL Forwarding IP Address* IE is included within the *Data Forwarding and* *Offloading Info from source NG-RAN node* IE in the *PDU Session Resource Setup Info – SN terminated* IE and/or in the *PDU Session Resource Modification Info – SN terminated* IE contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If for a given QoS Flow the *Source DL Forwarding IP Address* IE is included within the *QoS Flows Mapped To DRB List* IE in the *PDU Session Resource Setup Response Info – SN terminated* IE and/or in the *PDU Session Resource Modification Response Info – SN terminated* IE contained in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, store this information and use it as part of its ACL functionality to identify source TNL address for data forwarding in case of subsequent handover preparation, if such ACL functionality is deployed.

If the *Management Based MDT PLMN Modification List* IE is contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, overwrite any previously stored Management Based MDT PLMN List information in the UE context and use the received information to determine subsequent selection of the UE for management based MDT defined in TS 32.422 [23].

If the *QMC Coordination Request* IE is contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node may use it as specified in TS 37.340 [8], and shall, if supported, include the *QMC Coordination Response* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the *Source SN to Target SN QMC Information Inquiry* IE set to "true" is contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, include the *Source SN to Target SN QMC Information* IE in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message.

If the S-NODE MODIFICATION REQUEST message contains the *IAB Authorization status* IE, the S-NG-RAN node shall, if supported, store it and use it as defined in TS 38.401[2].

For each QoS flow, if the *PDU Set QoS Parameters* IE is included in the *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource Setup Info – SN terminated* IE or the *PDU Session Resource Modification Info – SN terminated* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as specified in TS 23.501 [7].

For each DRB configured as MN-terminated SCG bearer, if the *PDU Set QoS Parameters* IE is included in the *DRB QoS* IE in the *PDU Session Resource Setup Info – MN terminated* IE or the *PDU Session Resource Modification Info – MN terminated* IE of the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, store this information and use it as specified in TS 23.501 [7].

For each DRB configured as MN-terminated SCG bearer, if the *ECN Marking or Congestion Information Reporting Request* IE is included in the *PDU Session Resource Setup Info – MN terminated* IE or the *PDU Session Resource Modification Info – MN terminated* IE contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, use it accordingly for the specific DRB. If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *PDU Session Resource Setup Response Info – MN terminated* IE or the *PDU Session Resource Modification Response Info – MN terminated* IE, the M-NG-RAN node shall, if supported, use it to deduce if ECN marking or congestion information reporting is active or not active.

For each QoS flow for which the *ECN Marking or Congestion Information Reporting Request* IE is included in the *PDU Session Resource Setup Info – SN terminated* IE and/or in the *PDU Session Resource Modification Info – SN terminated* IE contained in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall, if supported, use it accordingly for the specific QoS flow.

If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *PDU Session Resource Setup Response Info – SN terminated* IE and/or in the in the *PDU Session Resource Modification Response Info – SN terminated* IE contained in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.

**Interactions with the S-NG-RAN node Reconfiguration Completion procedure:**

If the S-NG-RAN node admits a modification of the UE context requiring the M-NG-RAN node to report about the success of the RRC connection reconfiguration procedure, the S-NG-RAN node shall start the timer TXnDCoverall when sending the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message to the M-NG-RAN node except for a request for conditional configuration. The reception of the S-NG-RAN node RECONFIGURATION COMPLETE message shall stop the timer TXnDCoverall if TXnDCoverall is running.

**Interaction with the Activity Notification procedure**

Upon receiving an S-NODE MODIFICATION REQUEST message containing the *Desired Activity Notification Level* IE, the S-NG-RAN node shall, if supported, use this information to decide whether to trigger subsequent Activity Notification procedures, or stop or modify ongoing triggering of these procedures due to a previous request.

**Interaction with the Xn-U Address Indication procedure**

For QoS flow mapped to DRBs configured with an SN terminated bearer option and removed from the SDAP in the S-NG-RAN node the S-NG-RAN node may provide data forwarding related information in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE within the *Data Forwarding and offloading Info from source NG-RAN node* IE, in which case the M-NG-RAN node may decide to provide data forwarding addresses to the S-NG-RAN node and trigger the Xn-U Address Indication procedure as specified in TS 37.340 [8].

For QoS flow offloading from the S-NG-RAN node to the M-NG-RAN, the S-NG-RAN node may provide the data forwarding related information in the S-NODE MODIFICATION REQUEST ACKNOWLEDGE within the *Data Forwarding and offloading Info from source NG-RAN node* IE, in which case the M-NG-RAN node may decide to provide data forwarding addresses to the S-NG-RAN node and trigger the Xn-U Address Indication procedure as specified in TS 37.340 [8].

**Interactions with the S-NG-RAN node initiated S-NG-RAN node Modification:**

If the *SN triggered* IE set to "TRUE" is included in the S-NODE MODIFICATION REQUEST message, the S-NG-RAN node shall consider that the procedure has been initiated in response to the previously initiated S-NG-RAN node initiated S-NG-RAN node Modification procedure.

**Interaction with the Path Switch Request procedure as specified in TS 38.413 [5]:**

For a split PDU session, if the *Integrity Protection Indication* IE and/or the *Confidentiality Protection Indication* IE included in the PATH SWITCH REQUEST ACKNOWLEDGE message is set to "preferred", the M-NG-RAN node may keep the current UP integrity protection and ciphering policy.

#### 8.3.3.3 Unsuccessful Operation



Figure 8.3.3.3-1: M-NG-RAN node initiated S-NG-RAN node Modification Preparation, unsuccessful operation

If the S-NG-RAN node does not admit any modification requested by the M-NG-RAN node, or a failure occurs during the M-NG-RAN node initiated S-NG-RAN node Modification Preparation, the S-NG-RAN node shall send the S-NODE MODIFICATION REQUEST REJECT message to the M-NG-RAN node. The message shall contain the *Cause* IE with an appropriate value.

If the S-NG-RAN node receives a S-NODE MODIFICATION REQUEST message containing the *M-NG-RAN node to S-NG-RAN node Container* IE that does not include required information as specified in TS 37.340 [8], the S-NG-RAN node shall send the S-NODE MODIFICATION REQUEST REJECT message to the M-NG-RAN node.

#### 8.3.3.4 Abnormal Conditions

If the S-NG-RAN node receives an S-NODE MODIFICATION REQUEST message including a *PDU Session Resources To Be Added Item* IE, containing neither the *PDU Session Resource Setup Info – SN terminated* IE nor the *PDU Session Resource Setup Info – MN terminated* IE, the S-NG-RAN node shall fail the S-NG-RAN node Modification Preparation procedure indicating an appropriate cause.

If the S-NG-RAN node receives an S-NODE MODIFICATION REQUEST message including a *PDU Session Resources To Be Modified Item* IE, containing neither the *PDU Session Resource Modification Info – SN terminated* IE nor the *PDU Session Resource Modification Info – MN terminated* IE, the S-NG-RAN node shall fail the S-NG-RAN node Modification Preparation procedure indicating an appropriate cause.

If the S-NG-RAN node receives an S-NODE MODIFICATION REQUEST message containing multiple *PDU Session ID* IEs (in the *PDU Session Resources To Be Released List* IE) set to the same value, the S-NG-RAN node shall initiate the release of one corresponding PDU Session and ignore the duplication of the instances of the selected corresponding PDU Sessions.

If the supported algorithms for encryption defined in the *NR Encryption Algorithms* IE in the *NR* *UE Security Capabilities* IE in the *UE Context Information* IE, plus the mandated support of NEA0 in all UEs (TS 33.501 [58]), do not match any algorithms defined in the configured list of allowed encryption algorithms in the S-NG-RAN node (TS 33.501 [28]), the S-NG-RAN node shall reject the procedure using the S-NODE MODIFICATION REQUEST REJECT message.

If the supported algorithms for integrity defined in the *NR Integrity Protection Algorithms* IE in the *NR* *UE Security Capabilities* IE in the *UE Context Information* IE do not match any algorithms defined in the configured list of allowed integrity protection algorithms in the S-NG-RAN node (TS 33.501 [28]), the S-NG-RAN node shall reject the procedure using the S-NODE MODIFICATION REQUEST REJECT message.

If the timer TXnDCprep expires before the M-NG-RAN node has received the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall regard the M-NG-RAN node initiated S-NG-RAN node Modification Preparation procedure as being failed and shall release the UE Context at the S-NG-RAN node.

If the *Lower Layer presence status change* IE set to "re-establish lower layers" is included in the S-NODE MODIFICATION REQUEST message and was not set to "release lower layers" before, the S-NG-RAN node shall ignore the IE.

If the S-NG-RAN node receives an S-NODE MODIFICATION REQUEST message containing, for a PDU session, a *PDU Session Resource Setup Info – SN terminated* IE for which the *Split Session Indicator* IE is included and set to "split", the *Security Result* IE is not included, and either the *Integrity Protection Indication* IE or the *Confidentiality Protection Indication* IE is set to "preferred", it shall reject the PDU session.

**Interactions with the S-NG-RAN node Reconfiguration Completion and S-NG-RAN node initiated S-NG-RAN node Release procedure:**

If the timer TXnDCoverall expires before the S-NG-RAN node has received the S-NODE RECONFIGURATION COMPLETE or the S-NODE RELEASE REQUEST message, the S-NG-RAN node shall regard the requested modification RRC connection reconfiguration as being not applied by the UE and shall trigger the S-NG-RAN node initiated S-NG-RAN node Release procedure.

**Interaction with the S-NG-RAN node initiated S-NG-RAN node Modification Preparation procedure:**

If the M-NG-RAN node, after having initiated the M-NG-RAN node initiated S-NG-RAN node Modification procedure, receives the S-NODE MODIFICATION REQUIRED message, the M-NG-RAN node shall refuse the S-NG-RAN node initiated S-NG-RAN node Modification procedure with an appropriate cause value in the *Cause* IE.

If the M-NG-RAN node has a Prepared S-NG-RAN node Modification and receives the S-NODE MODIFICATION REQUIRED message, the M-NG-RAN node shall respond with the S-NODE MODIFICATION REFUSE message to the S-NG-RAN node with an appropriate cause value in the *Cause* IE.

**Interaction with the M-NG-RAN node initiated S-NG-RAN node Release procedure:**

If the M-NG-RAN node receives an S-NODE MODIFICATION REQUEST ACKNOWLEDGE message including a *PDU Session Resources Admitted To Be Added Item* IE, containing neither the *PDU Session Resource Setup Response Info – SN terminated* IE nor the *PDU Session Resource Setup Response Info – MN terminated* IE, the M-NG-RAN node shall trigger the M-NG-RAN node initiated S-NG-RAN node Release procedure indicating an appropriate cause.

If the M-NG-RAN node receives an S-NODE MODIFICATION REQUEST ACKNOWLEDGE message including a *PDU Session Resources Admitted To Be Modified Item* IE, containing neither the *PDU Session Resource Modification Response Info – SN terminated* IE nor the *PDU Session Resource Modification Response Info – MN terminated* IE, the M-NG-RAN node shall trigger the M-NG-RAN node initiated S-NG-RAN node Release procedure indicating an appropriate cause.

If the timer TXnDCprep expires before the M-NG-RAN node has received the S-NODE MODIFICATION REQUEST ACKNOWLEDGE message, the M-NG-RAN node shall regard the S-NG-RAN node Modification Preparation procedure as being failed and may trigger the M-NG-RAN node initiated S-NG-RAN node Release procedure.

-------------------------------------- NEXT CHANGE --------------------------------------

#### 9.2.1.5 PDU Session Resource Setup Info – SN terminated

This IE contains information for the addition of S-NG-RAN node resources related to a PDU session for DRBs configured with an SN terminated bearer option.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| UL NG-U UP TNL Information at UPF | M |  | UP Transport Layer Information 9.2.3.30 | UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs | – |  |
| PDU Session Type | M |  | 9.2.3.19 |  | – |  |
| Network Instance | O |  | 9.2.3.85 | This IE shall be ignored if the *Common Network Instance* IE is present. | – |  |
| **QoS Flows To Be Setup List** |  | *1* |  |  | – |  |
| >**QoS Flow To Be Setup Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>QoS Flow Level QoS Parameters | M |  | 9.2.3.5 | For GBR QoS flows, this IE contains GBR QoS flow information as received at NG-C | – |  |
| >>Offered GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains M-Node offered GBR QoS Flow Information. | – |  |
| >>TSC Traffic Characteristics | O |  | 9.2.3.114 | Traffic pattern information associated with the QFI. Details in TS 23.501 [7]. | YES | ignore |
| >>Redundant QoS Flow Indicator | O |  | 9.2.3.118 |  | YES | ignore |
| >>ECN Marking or Congestion Information Reporting Request | O |  | 9.2.3.205 |  | YES | ignore |
| Data Forwarding and Offloading Info from source NG-RAN node | O |  | 9.2.1.17 |  | – |  |
| Security Indication | O |  | 9.2.3.52 |  | – |  |
| Security Result | O |  | 9.2.3.67 | Indicates security activation status in MN. | YES | reject |
| Common Network Instance | O |  | 9.2.3.92 |  | YES | ignore |
| Default DRB Allowed | O |  | 9.2.3.93 |  | YES | ignore |
| Split Session Indicator | O |  | 9.2.3.94 |  | YES | reject |
| Non-GBR Resources Offered | O |  | 9.2.3.98 |  | YES | ignore |
| Redundant UL NG-U UP TNL Information at UPF | O |  | UP Transport Layer Information  9.2.3.30 | UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs for the redundant transmission. | YES | ignore |
| Redundant Common Network Instance | O |  | Common Network Instance  9.2.3.92 |  | YES | ignore |
| Redundant PDU Session Information | O |  | 9.2.3.112 |  | YES | ignore |
| Selected NID | O |  | NID  9.2.2.65 | This IE, together with the *Selected PLMN* IE, indicates the SNPN proposed for the SCG to the S-NG-RAN node. | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows. Value is 64 |

#### 9.2.1.6 PDU Session Resource Setup Response Info – SN terminated

This IE contains the result of the addition of S-NG-RAN node resources related to a PDU session for DRBs configured with an SN terminated bearer option.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| DL NG-U UP TNL Information at NG-RAN | M |  | UP Transport Layer Information 9.2.3.30 | S-NG-RAN node endpoint of the NG transport bearer. For delivery of DL PDUs. | – |  |
| **DRBs To Be Setup List** |  | *0..1* |  |  | – |  |
| **>DRBs to Be Setup Item** |  | *1 .. <maxnoofDRBs>* |  |  | – |  |
| >>DRB ID | M |  | 9.2.3.33 |  | – |  |
| >>SN UL PDCP UP TNL Information | M |  | UP Transport Parameters 9.2.3. 76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs. | – |  |
| >>DRB QoS | M |  | QoS Flow Level QoS Parameters  9.2.3.5 |  | – |  |
| >>PDCP SN Length | O |  | 9.2.3.63 | Indicates the PDCP SN length of the DRB. | – |  |
| >>RLC Mode | M |  | 9.2.3.28 | Indicates the RLC mode to be used in the assisting node. | – |  |
| >>secondary SN UL PDCP UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of PDCP duplication. | – |  |
| >>Duplication Activation | O |  | 9.2.3.71 | Information on the initial state of UL PDCP duplication.  This IE is ignored if the *RLC Duplication Information* IE is present. | – |  |
| >>UL Configuration | O |  | 9.2.3.75 | Information about UL usage in the M-NG-RAN node. This IE is used when the concerned DRB has both MCG resource and SCG resource configured i.e. the concerned DRB is configured as split bearer. | – |  |
| **>>QoS Flows Mapped To DRB List** |  | *1* |  |  | – |  |
| **>>>QoS Flows Mapped To DRB Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>>>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>>>MCG requested GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains GBR QoS Flow Information necessary for the MCG part. | – |  |
| >>>>QoS Flow Mapping Indication | O |  | 9.2.3.79 |  | – |  |
| >>>>Current QoS Parameters Set Index | O |  | Alternative QoS Parameters Set Index  9.2.3.103 |  | YES | ignore |
| >>>>Source DL Forwarding IP Address | O |  | Transport Layer Address  9.2.3.29 | Identifies the TNL address used by the source node for data forwarding. | YES | ignore |
| **>>Additional PDCP Duplication TNL List** |  | *0..1* |  |  | YES | ignore |
| **>>>Additional PDCP Duplication TNL Item** |  | *1 .. <maxnoofAdditionalPDCPDuplicationTNL>* |  |  | – |  |
| >>>>Additional PDCP Duplication UP TNL Information | M |  | UP Transport Layer Information 9.2.3.30 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of additional PDCP duplication. | – |  |
| >>RLC Duplication Information | O |  | 9.2.3.111 | . | – |  |
| >>ECN Marking or Congestion Information Reporting Status | O |  | 9.2.3.x1 |  | YES | ignore |
| Data Forwarding Info from target NG-RAN node | O |  | 9.2.1.16 |  | – |  |
| QoS Flows Not Admitted List | O |  | QoS Flow List with Cause  9.2.1.4 |  | – |  |
| Security Result | O |  | 9.2.3.67 |  | – |  |
| DRB IDs taken into use | O |  | DRB List 9.2.1.29 | Indicating the DRB IDs taken into use by the target NG-RAN node, as specified in TS 37.340 [8]. | YES | reject |
| Redundant DL NG-U UP TNL Information at NG-RAN | O |  | UP Transport Layer Information  9.2.3.30 | S-NG-RAN node endpoint of the NG transport bearer. For delivery of DL PDUs for the redundant transmission. | YES | ignore |
| Used RSN Information | O |  | Redundant PDU Session Information  9.2.3.112 |  | YES | ignore |
| Data Forwarding and Offloading Info from source NG-RAN node | O |  | 9.2.1.17 | Contains data forwarding proposal for S-CPAC, to be used later when the S-NG-RAN node is selected for access. | YES | ignore |
| **Additional DRB Setup Info List** | O |  | 9.2.3.x2 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofDRBs | Maximum no. of DRBs allowed towards one UE. Value is 32. |
| maxnoofQoSFlows | Maximum no. of QoS flows. Value is 64 |
| maxnoofAdditionalPDCPDuplicationTNL | Maximum no. of additional PDCP Duplication TNL. Value is 2. |

Unchanged Text Skipped

#### 9.2.1.9 PDU Session Resource Modification Info – SN terminated

This IE contains information related to a PDU session resource for an M-NG-RAN node initiated request to modify DRBs configured with an SN terminated bearer option.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| UL NG-U UP TNL Information at UPF | O |  | UP Transport Layer Information 9.2.3.30 | UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs | – |  |
| Network Instance | O |  | 9.2.3.85 | This IE shall be ignored if the *Common Network Instance* IE is present. | – |  |
| **QoS Flows To Be Setup List** |  | *0..1* |  |  | – |  |
| **>QoS Flows To Be Setup Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>QoS Flow Level QoS Parameters | M |  | 9.2.3.5 | For GBR QoS flows, this IE contains GBR QoS flow information as received at NG-C. | – |  |
| >>Offered GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains M-Node offered GBR QoS Flow Information. | – |  |
| >>TSC Traffic Characteristics | O |  | 9.2.3.114 | Traffic pattern information associated with the QFI. Details in TS 23.501 [7]. | YES | ignore |
| >>Redundant QoS Flow Indicator | O |  | 9.2.3.118 |  | YES | ignore |
| >>ECN Marking or Congestion Information Reporting Request | O |  | 9.2.3.205 |  | YES | ignore |
| Data Forwarding and Offloading Info from source NG-RAN node | O |  | 9.2.1.17 | Applicable for the QoS flows contained in the *QoS Flows To Be Setup List* IE. | – |  |
| **QoS Flows To Be Modified List** |  | *0..1* |  |  | – |  |
| **>QoS Flows To Be Modified Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>QoS Flow Level QoS Parameters | O |  | 9.2.3.5 | For GBR QoS flows, this IE contains GBR QoS flow information as received at NG-C. | – |  |
| >>Offered GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains M-Node offered GBR QoS Flow Information. | – |  |
| >>QoS Flow Mapping Indication | O |  | 9.2.3.79 | This IE is not applicable in this version of the specification. | – |  |
| >>TSC Traffic Characteristics | O |  | 9.2.3.114 | Traffic pattern information associated with the QFI. Details in TS 23.501 [7]. | YES | ignore |
| >>Redundant QoS Flow Indicator | O |  | 9.2.3.118 |  | YES | ignore |
| >>ECN Marking or Congestion Information Reporting Request | O |  | 9.2.3.205 |  | YES | ignore |
| QoS Flows To Be Released List |  | *0..1* | QoS Flow List with Cause  9.2.1.4 |  | – |  |
| **DRBs To Be Modified List** |  | *0..1* |  |  | – |  |
| **>DRBs to Be Modified Item** |  | *1 .. <maxnoofDRBs>* |  |  | – |  |
| >>DRB ID | M |  | 9.2.3.33 |  | – |  |
| >>MN DL CG UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | M-NG-RAN node GTP-U endpoint(s) of a DRB’s Xn transport bearer at its lower layer CG resource. For delivery of DL PDUs. | – |  |
| >>secondary MN DL CG UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | M-NG-RAN node GTP-U endpoint(s) of a DRB’s Xn transport bearer at its lower layer CG resource. For delivery of DL PDUs in case of PDCP duplication. | – |  |
| >>LCID | O |  | 9.2.3.70 | LCID for primary path or LCID for split secondary path for fallback to split bearer if PDCP duplication is applied | – |  |
| >>RLC Status | O |  | 9.2.3.80 |  | – |  |
| **>>Additional PDCP Duplication TNL List** |  | *0..1* |  |  | YES | ignore |
| **>>>Additional PDCP Duplication TNL Item** |  | *1 .. <maxnoofAdditionalPDCPDuplicationTNL>* |  |  | – |  |
| >>>>Additional PDCP Duplication UP TNL Information | M |  | UP Transport Layer Information 9.2.3.30 | M-NG-RAN node GTP-U endpoint(s) of a DRB’s Xn transport bearer at its lower layer CG resource. For delivery of DL PDUs in case of additional PDCP duplication. | – |  |
| DRBs To Be Released List | O |  | DRB List with Cause  9.2.1.28 |  | – |  |
| Common Network Instance | O |  | 9.2.3.92 |  | YES | ignore |
| Default DRB Allowed | O |  | 9.2.3.93 |  | YES | ignore |
| Non-GBR Resources Offered | O |  | 9.2.3.98 |  | YES | ignore |
| Redundant UL NG-U UP TNL Information at UPF | O |  | UP Transport Layer Information  9.2.3.30 | UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs for the redundant transmission | YES | ignore |
| Redundant Common Network Instance | O |  | Common Network Instance  9.2.3.92 |  | YES | ignore |
| Security Indication | O |  | 9.2.3.52 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows. Value is 64. |
| maxnoofAdditionalPDCPDuplicationTNL | Maximum no. of additional PDCP Duplication TNL. Value is 2. |

#### 9.2.1.10 PDU Session Resource Modification Response Info – SN terminated

This IE contains the PDU session resource related result of an M-NG-RAN node initiated request to modify DRBs configured with an SN terminated bearer option.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| DL NG-U UP TNL Information at NG-RAN | O |  | UP Transport Layer Information 9.2.3.30 | S-NG-RAN node endpoint of the NG transport bearer. For delivery of DL PDUs. | – |  |
| **DRBs To Be Setup List** |  | *0..1* |  |  | – |  |
| **>DRBs to Be Setup Item** |  | *1 .. <maxnoofDRBs>* |  |  | – |  |
| >>DRB ID | M |  | 9.2.3.33 |  | – |  |
| >>SN UL PDCP UP TNL Information | M |  | UP Transport Parameters 9.2.3.76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs. | – |  |
| >>DRB QoS | M |  | QoS Flow Level QoS Parameters  9.2.3.5 |  | – |  |
| >>PDCP SN Length | O |  | 9.2.3.63 | Indicates the PDCP SN length of the DRB. | – |  |
| >>RLC Mode | M |  | 9.2.3.28 | Indicates the RLC mode to be used in the assisting node. | – |  |
| >>secondary SN UL PDCP UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of PDCP duplication. | – |  |
| >>Duplication Activation | O |  | 9.2.3.71 | Information on the initial state of UL PDCP duplication.  This IE is ignored if the *RLC Duplication Information* IE is present. | – |  |
| >>UL Configuration | O |  | 9.2.3.75 | Information about UL usage in the M-NG-RAN node. This IE is used when the concerned DRB has both MCG resource and SCG resource configured i.e. the concerned DRB is configured as split bearer. | – |  |
| **>>QoS Flows Mapped To DRB List** |  | *1* |  |  | – |  |
| **>>>QoS Flows Mapped To DRB Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>>>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>>>MCG requested GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains GBR QoS Flow Information necessary for the MCG part. | – |  |
| >>>>QoS Flow Mapping Indication | O |  | 9.2.3.79 |  | – |  |
| >>>>Current QoS Parameters Set Index | O |  | Alternative QoS Parameters Set Index  9.2.3.103 |  | YES | ignore |
| >>>>Source DL Forwarding IP Address | O |  | Transport Layer Address  9.2.3.29 | Identifies the TNL address used by the source node for data forwarding. | YES | ignore |
| **>>Additional PDCP Duplication TNL List** |  | *0..1* |  |  | YES | ignore |
| **>>>Additional PDCP Duplication TNL Item** |  | *1 .. <maxnoofAdditionalPDCPDuplicationTNL>* |  |  | – |  |
| >>>>Additional PDCP Duplication UP TNL Information | M |  | UP Transport Layer Information 9.2.3.30 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of additional PDCP duplication. | – |  |
| >>RLC Duplication Information | O |  | 9.2.3.111 |  | YES | ignore |
| >>ECN Marking or Congestion Information Reporting Status | O |  | 9.2.3.x1 |  | YES | ignore |
| Data Forwarding Info from target NG-RAN node | O |  | 9.2.1.16 | Applicable for the QoS flows in DRBs to be setup. | – |  |
| **DRBs To Be Modified List** |  | *0..1* |  |  | – |  |
| **>DRBs to Be Modified Item** |  | *1 .. <maxnoofDRBs>* |  |  | – |  |
| >>DRB ID | M |  | 9.2.3.33 |  | – |  |
| >>SN UL PDCP UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs. | – |  |
| >>DRB QoS | O |  | QoS Flow Level QoS Parameters  9.2.3.5 |  | – |  |
| **>>QoS Flows Mapped to DRB List** |  | *0..1* |  | Overwriting the existing QoS Flow List | – |  |
| **>>>QoS Flows Mapped to DRB Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>>>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>>>MCG requested GBR QoS Flow Information | O |  | GBR QoS Flow Information  9.2.3.6 | This IE contains GBR QoS Flow Information necessary for the MCG part. | – |  |
| >>>>QoS Flow Mapping Indication | O |  | 9.2.3.79 |  | – |  |
| >>>>Current QoS Parameters Set Index | O |  | Alternative QoS Parameters Set Index  9.2.3.103 |  | YES | ignore |
| >>>>Source DL Forwarding IP Address | O |  | Transport Layer Address  9.2.3.29 | Identifies the TNL address used by the source node for data forwarding. | YES | ignore |
| **>>Additional PDCP Duplication TNL List** |  | *0..1* |  |  | YES | ignore |
| **>>>Additional PDCP Duplication TNL Item** |  | *1 .. <maxnoofAdditionalPDCPDuplicationTNL>* |  |  | – |  |
| >>>>Additional PDCP Duplication UP TNL Information | M |  | UP Transport Layer Information 9.2.3.30 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of additional PDCP duplication. | – |  |
| >>RLC Duplication Information | O |  | 9.2.3.111 |  | YES | ignore |
| >>secondary SN UL PDCP UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | S-NG-RAN node endpoint(s) of a DRB’s Xn transport bearer at its PDCP resource. For delivery of UL PDUs in case of PDCP duplication. | YES | ignore |
| >>PDCP Duplication Configuration | O |  | 9.2.3.86 |  | YES | ignore |
| >>Duplication Activation | O |  | 9.2.3.71 |  | YES | ignore |
| >>ECN Marking or Congestion Information Reporting Status | O |  | 9.2.3.xx |  | YES | ignore |
| DRBs To Be Released List | O |  | DRB List with Cause  9.2.1.28 |  | – |  |
| Data Forwarding and Offloading Info from source NG-RAN node | O |  | 9.2.1.17 | Contains DL Data Forwarding indications for QoS Flows removed from the SDAP in the SN. | – |  |
| QoS Flows Not Admitted to be Added List | O |  | QoS Flow List with Cause  9.2.1.4 |  | – |  |
| QoS Flows Released List | O |  | QoS Flow List with Cause  9.2.1.4 |  | – |  |
| DRB IDs taken into use | O |  | DRB List 9.2.1.29 | Indicating the DRB IDs taken into use by the target NG-RAN node, as specified in TS 37.340 [8]. | YES | reject |
| Redundant DL NG-U UP TNL Information at NG-RAN | O |  | UP Transport Layer Information  9.2.3.30 | S-NG-RAN node endpoint of the NG transport bearer. For delivery of DL PDUs for the redundant transmission. | YES | ignore |
| Security Result | O |  | 9.2.3.67 |  | YES | ignore |
| **Additional DRB Setup Info List** | O |  | 9.2.3.x2 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofDRBs | Maximum no. of DRBs allowed towards one UE. Value is 32. |
| maxnoofQoSFlows | Maximum no. of QoS flows. Value is 64. |
| maxnoofAdditionalPDCPDuplicationTNL | Maximum no. of additional PDCP Duplication TNL. Value is 2. |

#### 9.2.3.x2 Additional DRB Setup Info List

This IE indicates the ECN Marking or Congestion Information Reporting Status for a list of DRBs.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | |
| **Additional DRB Setup Info List** |  | 1 |  |  |
| **>Additional DRBs to Be Setup Item** |  | *1 .. <maxnoofDRBs>* |  | Includes a list of DRBs admitted for SCG bearers together with their ECN Marking or Congestion Information Reporting Status |
| >>DRB ID | M |  | 9.2.3.33 |  |
| **>>QoS Flows Mapped To DRB List** |  | *1* |  |  |
| **>>>QoS Flows Mapped To DRB Item** |  | *1 .. <maxnoofQoSFlows>* |  |  |
| >>>>QoS Flow Identifier | M |  | 9.2.3.10 |  |
| >>ECN Marking or Congestion Information Reporting Status | M |  | 9.2.3.x1 |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofDRBs | Maximum no. of DRBs allowed towards one UE. Value is 32. |
| maxnoofQoSFlows | Maximum no. of QoS flows. Value is 64. |

----------------------------------------------------------------------------- START OF ASN.1 CHANGES -----------------------------------------------------------------------------

### 9.3.5 Information Element definitions

----------------------------------------------------------------------------- NEXT CHANGE -----------------------------------------------------------------------------

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

--

-- PDU Session Resource Setup Info - SN terminated

--

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

PDUSessionResourceSetupInfo-SNterminated ::= SEQUENCE {

uL-NG-U-TNLatUPF UPTransportLayerInformation,

pduSessionType PDUSessionType,

pduSessionNetworkInstance PDUSessionNetworkInstance OPTIONAL,

qosFlowsToBeSetup-List QoSFlowsToBeSetup-List-Setup-SNterminated,

dataforwardinginfofromSource DataforwardingandOffloadingInfofromSource OPTIONAL,

securityIndication SecurityIndication OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {PDUSessionResourceSetupInfo-SNterminated-ExtIEs} } OPTIONAL,

...

}

PDUSessionResourceSetupInfo-SNterminated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

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

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

{ ID id-DefaultDRB-Allowed CRITICALITY ignore EXTENSION DefaultDRB-Allowed PRESENCE optional}|

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

{ ID id-NonGBRResources-Offered CRITICALITY ignore EXTENSION NonGBRResources-Offered PRESENCE optional}|

{ ID id-Redundant-UL-NG-U-TNLatUPF CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional}|

{ ID id-RedundantCommonNetworkInstance CRITICALITY ignore EXTENSION PDUSessionCommonNetworkInstance PRESENCE optional}|

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

...

}

QoSFlowsToBeSetup-List-Setup-SNterminated ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF QoSFlowsToBeSetup-List-Setup-SNterminated-Item

QoSFlowsToBeSetup-List-Setup-SNterminated-Item ::= SEQUENCE {

qfi QoSFlowIdentifier,

qosFlowLevelQoSParameters QoSFlowLevelQoSParameters,

offeredGBRQoSFlowInfo GBRQoSFlowInfo OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QoSFlowsToBeSetup-List-Setup-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

QoSFlowsToBeSetup-List-Setup-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

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

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

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

...

}

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

--

-- PDU Session Resource Setup Response Info - SN terminated

--

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

PDUSessionResourceSetupResponseInfo-SNterminated ::= SEQUENCE {

dL-NG-U-TNLatNG-RAN UPTransportLayerInformation,

dRBsToBeSetup DRBsToBeSetupList-SetupResponse-SNterminated OPTIONAL,

dataforwardinginfoTarget DataForwardingInfoFromTargetNGRANnode OPTIONAL,

qosFlowsNotAdmittedList QoSFlows-List-withCause OPTIONAL,

securityResult SecurityResult OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {PDUSessionResourceSetupResponseInfo-SNterminated-ExtIEs} } OPTIONAL,

...

}

PDUSessionResourceSetupResponseInfo-SNterminated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-DRB-IDs-takenintouse CRITICALITY reject EXTENSION DRB-List PRESENCE optional}|

{ ID id-Redundant-DL-NG-U-TNLatNG-RAN CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional}|

{ ID id-UsedRSNInformation CRITICALITY ignore EXTENSION RedundantPDUSessionInformation PRESENCE optional}|

{ ID id-S-CPAC-dataforwardinginfofromSource CRITICALITY ignore EXTENSION DataforwardingandOffloadingInfofromSource PRESENCE optional}|

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

...

}

DRBsToBeSetupList-SetupResponse-SNterminated ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRBsToBeSetupList-SetupResponse-SNterminated-Item

DRBsToBeSetupList-SetupResponse-SNterminated-Item ::= SEQUENCE {

drb-ID DRB-ID,

sN-UL-PDCP-UP-TNLInfo UPTransportParameters,

dRB-QoS QoSFlowLevelQoSParameters,

pDCP-SNLength PDCPSNLength OPTIONAL,

rLC-Mode RLCMode,

uL-Configuration ULConfiguration OPTIONAL,

secondary-SN-UL-PDCP-UP-TNLInfo UPTransportParameters OPTIONAL,

duplicationActivation DuplicationActivation OPTIONAL,

qoSFlowsMappedtoDRB-SetupResponse-SNterminated QoSFlowsMappedtoDRB-SetupResponse-SNterminated,

iE-Extensions ProtocolExtensionContainer { {DRBsToBeSetupList-SetupResponse-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

DRBsToBeSetupList-SetupResponse-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-Additional-PDCP-Duplication-TNL-List CRITICALITY ignore EXTENSION Additional-PDCP-Duplication-TNL-List PRESENCE optional}|

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

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

...

}

QoSFlowsMappedtoDRB-SetupResponse-SNterminated ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF

QoSFlowsMappedtoDRB-SetupResponse-SNterminated-Item

QoSFlowsMappedtoDRB-SetupResponse-SNterminated-Item ::= SEQUENCE {

qoSFlowIdentifier QoSFlowIdentifier,

mCGRequestedGBRQoSFlowInfo GBRQoSFlowInfo OPTIONAL,

qosFlowMappingIndication QoSFlowMappingIndication OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QoSFlowsMappedtoDRB-SetupResponse-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

QoSFlowsMappedtoDRB-SetupResponse-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-CurrentQoSParaSetIndex CRITICALITY ignore EXTENSION QoSParaSetIndex PRESENCE optional }|

{ ID id-SourceDLForwardingIPAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},

...

}

AdditionalDRBSetupInfoList ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF AdditionalDRBsToBeSetupInfo-Item

AdditionalDRBsToBeSetupInfo-Item ::= SEQUENCE {

drb-ID DRB-ID,

additionalQoSFlowSetupInfoList AdditionalQoSFlowSetupInfoList,

eCNMarkingorCongestionInformationReportingStatus ECNMarkingorCongestionInformationReportingStatus,

iE-Extensions ProtocolExtensionContainer { { AdditionalDRBsToBeSetupInfo-Item-ExtIEs} } OPTIONAL,

...

}

AdditionalDRBsToBeSetupInfo-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

AdditionalQoSFlowSetupInfoList ::= SEQUENCE (SIZE(0..maxnoofQoSFlows)) OF

AdditionalQoSFlowSetupInfoList-Item

AdditionalQoSFlowSetupInfoList-Item ::= SEQUENCE {

qoSFlowIdentifier QoSFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { { AdditionalQoSFlowSetupInfoList-Item-ExtIEs} } OPTIONAL,

...

}

AdditionalQoSFlowSetupInfoList-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

----------------------------------------------------------------------------- NEXT CHANGE -----------------------------------------------------------------------------

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

--

-- PDU Session Resource Modification Info - SN terminated

--

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

PDUSessionResourceModificationInfo-SNterminated ::= SEQUENCE {

uL-NG-U-TNLatUPF UPTransportLayerInformation OPTIONAL,

pduSessionNetworkInstance PDUSessionNetworkInstance OPTIONAL,

qosFlowsToBeSetup-List QoSFlowsToBeSetup-List-Setup-SNterminated OPTIONAL,

dataforwardinginfofromSource DataforwardingandOffloadingInfofromSource OPTIONAL,

qosFlowsToBeModified-List QoSFlowsToBeSetup-List-Modified-SNterminated OPTIONAL,

qoSFlowsToBeReleased-List QoSFlows-List-withCause OPTIONAL,

drbsToBeModifiedList DRBsToBeModified-List-Modified-SNterminated OPTIONAL,

dRBsToBeReleased DRB-List-withCause OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {PDUSessionResourceModificationInfo-SNterminated-ExtIEs} } OPTIONAL,

...

}

PDUSessionResourceModificationInfo-SNterminated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

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

{ID id-DefaultDRB-Allowed CRITICALITY ignore EXTENSION DefaultDRB-Allowed PRESENCE optional}|

{ID id-NonGBRResources-Offered CRITICALITY ignore EXTENSION NonGBRResources-Offered PRESENCE optional}|

{ID id-Redundant-UL-NG-U-TNLatUPF CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional}|

{ID id-RedundantCommonNetworkInstance CRITICALITY ignore EXTENSION PDUSessionCommonNetworkInstance PRESENCE optional}|

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

...

}

QoSFlowsToBeSetup-List-Modified-SNterminated ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF QoSFlowsToBeSetup-List-Modified-SNterminated-Item

QoSFlowsToBeSetup-List-Modified-SNterminated-Item ::= SEQUENCE {

qfi QoSFlowIdentifier,

qosFlowLevelQoSParameters QoSFlowLevelQoSParameters OPTIONAL,

offeredGBRQoSFlowInfo GBRQoSFlowInfo OPTIONAL,

qosFlowMappingIndication QoSFlowMappingIndication OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {QoSFlowsToBeSetup-List-Modified-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

QoSFlowsToBeSetup-List-Modified-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

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

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

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

...

}

DRBsToBeModified-List-Modified-SNterminated ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRBsToBeModified-List-Modified-SNterminated-Item

DRBsToBeModified-List-Modified-SNterminated-Item ::= SEQUENCE {

drb-ID DRB-ID,

mN-DL-SCG-UP-TNLInfo UPTransportParameters OPTIONAL,

secondary-MN-DL-SCG-UP-TNLInfo UPTransportParameters OPTIONAL,

lCID LCID OPTIONAL,

rlc-status RLC-Status OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {DRBsToBeModified-List-Modified-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

DRBsToBeModified-List-Modified-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-Additional-PDCP-Duplication-TNL-List CRITICALITY ignore EXTENSION Additional-PDCP-Duplication-TNL-List PRESENCE optional},

...

}

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

--

-- PDU Session Resource Modification Response Info - SN terminated

--

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

PDUSessionResourceModificationResponseInfo-SNterminated ::= SEQUENCE {

dL-NG-U-TNLatNG-RAN UPTransportLayerInformation OPTIONAL,

dRBsToBeSetup DRBsToBeSetupList-SetupResponse-SNterminated OPTIONAL,

dataforwardinginfoTarget DataForwardingInfoFromTargetNGRANnode OPTIONAL,

dRBsToBeModified DRBsToBeModifiedList-ModificationResponse-SNterminated OPTIONAL,

dRBsToBeReleased DRB-List-withCause OPTIONAL,

dataforwardinginfofromSource DataforwardingandOffloadingInfofromSource OPTIONAL,

qosFlowsNotAdmittedTBAdded QoSFlows-List-withCause OPTIONAL,

qosFlowsReleased QoSFlows-List-withCause OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {PDUSessionResourceModificationResponseInfo-SNterminated-ExtIEs} } OPTIONAL,

...

}

PDUSessionResourceModificationResponseInfo-SNterminated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-DRB-IDs-takenintouse CRITICALITY reject EXTENSION DRB-List PRESENCE optional}|

{ ID id-Redundant-DL-NG-U-TNLatNG-RAN CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional}|

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

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

...

}

DRBsToBeModifiedList-ModificationResponse-SNterminated ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF

DRBsToBeModifiedList-ModificationResponse-SNterminated-Item

DRBsToBeModifiedList-ModificationResponse-SNterminated-Item ::= SEQUENCE {

drb-ID DRB-ID,

sN-UL-PDCP-UP-TNLInfo UPTransportParameters OPTIONAL,

dRB-QoS QoSFlowLevelQoSParameters OPTIONAL,

qoSFlowsMappedtoDRB-SetupResponse-SNterminated QoSFlowsMappedtoDRB-SetupResponse-SNterminated OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {DRBsToBeModifiedList-ModificationResponse-SNterminated-Item-ExtIEs} } OPTIONAL,

...

}

DRBsToBeModifiedList-ModificationResponse-SNterminated-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

{ ID id-Additional-PDCP-Duplication-TNL-List CRITICALITY ignore EXTENSION Additional-PDCP-Duplication-TNL-List PRESENCE optional}|

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

{ ID id-secondary-SN-UL-PDCP-UP-TNLInfo CRITICALITY ignore EXTENSION UPTransportParameters PRESENCE optional}|

{ ID id-pdcpDuplicationConfiguration CRITICALITY ignore EXTENSION PDCPDuplicationConfiguration PRESENCE optional}|

{ ID id-duplicationActivation CRITICALITY ignore EXTENSION DuplicationActivation PRESENCE optional}}|

{ ID id-ECNMarkingorCongestionInformationReportingRequest CRITICALITY ignore EXTENSION ECNMarkingorCongestionInformationReportingStatus PRESENCE optional},

...

}

AdditionalDRBSetupInfoList ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF AdditionalDRBsToBeSetupInfo-Item

AdditionalDRBsToBeSetupInfo-Item ::= SEQUENCE {

drb-ID DRB-ID,

additionalQoSFlowSetupInfoList AdditionalQoSFlowSetupInfoList,

eCNMarkingorCongestionInformationReportingStatus ECNMarkingorCongestionInformationReportingStatus,

iE-Extensions ProtocolExtensionContainer { { AdditionalDRBsToBeSetupInfo-Item-ExtIEs} } OPTIONAL,

...

}

AdditionalDRBsToBeSetupInfo-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

AdditionalQoSFlowSetupInfoList ::= SEQUENCE (SIZE(0..maxnoofQoSFlows)) OF

AdditionalQoSFlowSetupInfoList-Item

AdditionalQoSFlowSetupInfoList-Item ::= SEQUENCE {

qoSFlowIdentifier QoSFlowIdentifier,

iE-Extensions ProtocolExtensionContainer { { AdditionalQoSFlowSetupInfoList-Item-ExtIEs} } OPTIONAL,

...

}

AdditionalQoSFlowSetupInfoList-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

----------------------------------------------------------------------------- END OF CHANGES -----------------------------------------------------------------------------