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**Agenda item: 25.2.1**

**Source: Nokia, Nokia Shanghai Bell, Ericsson, ZTE, Huawei**

**Title: (TP for TS 38.413 BL CR) support for PDU Set based QoS handling**

**Document for: Discussion and Decision**

# 1 Introduction

This contribution includes TP to support following:

* PDU Set based Handling Indicator
* N6 Jitter

# Annex A – TP for TS 38.413 BL CR

<<<<<<<<<<<<<<<<<<<< Start of Changes >>>>>>>>>>>>>>>>>>>>

### 8.2.1 PDU Session Resource Setup

#### 8.2.1.1 General

The purpose of the PDU Session Resource Setup procedure is to assign resources on Uu and NG-U for one or several PDU sessions and the corresponding QoS flows, and to setup corresponding DRBs for a given UE. The procedure uses UE-associated signalling.

#### 8.2.1.2 Successful Operation



Figure 8.2.1.2-1: PDU session resource setup: successful operation

The AMF initiates the procedure by sending a PDU SESSION RESOURCE SETUP REQUEST message to the NG-RAN node.

\*\* Unchanged text skipped \*\*

For each QoS flow which has been successfully established, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

For each QoS flow requested to be setup, if the *PDU Set QoS Parameters* IE is included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store the received PDU Set QoS Parameters in the UE context and use it as specified in TS 23.501 [9]. If the *ECN marking or Congestion Monitoring Request* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it accordingly for the specific QoS flow.

For each QoS flow requested to be setup the NG-RAN node shall take into account the received *QoS Flow Level QoS Parameters* IE. For each QoS flow the NG-RAN node shall establish or modify the resources according to the values of the *Allocation and Retention Priority* IE (priority level and pre-emption indicators) and the resource situation as follows:

\*\* Unchanged text skipped \*\*

The NG-RAN node shall report to the AMF in the PDU SESSION RESOURCE SETUP RESPONSE message the result for each PDU session resource requested to be setup:

- For each PDU session resource successfully setup, the *PDU Session Resource Setup Response Transfer* IE shall be included containing:

1. The NG-U UP transport layer information to be used for the PDU session and associated list of QoS flows which have been successfully established, in the *QoS Flow per TNL Information* IE.

2. The list of QoS flows which failed to be established, if any, in the *QoS Flow Failed to Setup List* IE. When the NG-RAN node reports unsuccessful establishment of a QoS flow, the cause value should be precise enough to enable the SMF to know the reason for the unsuccessful establishment.

- For each PDU session resource which failed to be setup, the *PDU Session Resource Setup Unsuccessful Transfer* IE shall be included containing a cause value that should be precise enough to enable the SMF to know the reason for the unsuccessful establishment.

Upon reception of the PDU SESSION RESOURCE SETUP RESPONSE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Setup Response Transfer* IE or *PDU Session Resource Setup Unsuccessful Transfer* IE to the SMF associated with the concerned PDU session.

Upon reception of the PDU SESSION RESOURCE SETUP REQUEST message to setup a QoS flow for IMS voice, if the NG-RAN node is not able to support IMS voice, the NG-RAN node shall initiate EPS fallback or RAT fallback for IMS voice procedure as specified in TS 23.501 [9] and report unsuccessful establishment of the QoS flow in the *PDU Session Resource Setup Response Transfer* IE or in the *PDU Session Resource Setup Unsuccessful Transfer* IE with cause value "IMS voice EPS fallback or RAT fallback triggered".

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE SETUP RESPONSE message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

The *UE Aggregate Maximum Bit Rate* IE should be sent to the NG-RAN node if the AMF has not sent it previously. If it is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store the UE Aggregate Maximum Bit Rate in the UE context, and use the received UE Aggregate Maximum Bit Rate for all Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [9].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

If the *UE Slice Maximum Bit Rate List* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store the UE Slice Maximum Bit Rate List in the UE context, and use it for each S-NSSAI for the concerned UE as specified in TS 23.501 [9].

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE SETUP RESPONSE message location information of the UE in the *User Location Information* IE.

If the *User Location Information* IE is included in the PDU SESSION RESOURCE SETUP RESPONSE message, the AMF shall handle this information as specified in TS 23.501 [9].

If the *PDU Set QoS Parameters* IE is included in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE SETUP RESPONSE message the *PDU Set based Handling Indicator* IE in the *PDU Session Resource Setup Response Transfer* IE. If the *PDU Set based Handling Indicator* IE is included in the *PDU Session Resource Setup Response Transfer* IE in the PDU SESSION RESOURCE SETUP RESPONSE message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

**Interactions with Handover Preparation procedure:**

If a handover becomes necessary during the PDU Session Resource Setup procedure, the NG-RAN node may interrupt the ongoing PDU Session Resource Setup procedure and initiate the Handover Preparation procedure as follows:

1. The NG-RAN node shall send the PDU SESSION RESOURCE SETUP RESPONSE message in which the NG-RAN node shall indicate, if necessary, all the PDU session resources which failed to be setup with an appropriate cause value, e.g. "NG intra-system handover triggered", "NG inter-system handover triggered" or "Xn handover triggered".

2. The NG-RAN node shall trigger the handover procedure.

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### 8.2.3 PDU Session Resource Modify

#### 8.2.3.1 General

The purpose of the PDU Session Resource Modify procedure is to enable configuration modifications of already established PDU session(s) for a given UE. It is also to enable the setup, modification and release of the QoS flow for already established PDU session(s). The procedure uses UE-associated signalling.

#### 8.2.3.2 Successful Operation



Figure 8.2.3.2-1: PDU session resource modify: successful operation

The AMF initiates the procedure by sending a PDU SESSION RESOURCE MODIFY REQUEST message to the NG-RAN node.

\*\* Unchanged text skipped \*\*

For each PDU session included in the *PDU Session Resource Modify Request List* IE:

- For each QoS flow included in the *QoS Flow Add or Modify Request List* IE, based on the *QoS Flow Level QoS Parameters* IE, the NG-RAN node may establish, modify or release the DRB configuration and may change allocation of resources on NG or Uu accordingly. The NG-RAN node shall associate each QoS flow accepted to setup or modify which is not associated with an MBS QoS flow with a DRB of the PDU session. The associated DRB for the QoS flow accepted to modify may not change. If the *PDU Set QoS Parameters* IE is received, the NG-RAN node shall, if supported, store the received PDU Set QoS Parameters in the UE context and use it as specified in TS 23.501 [9]. If the *ECN marking or Congestion Monitoring Request* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it accordingly for the specific QoS flow.

- For each QoS flow, if the *Redundant QoS Flow Indicator* IE is included, the NG-RAN node shall, if supported, store it and consider it for the redundant transmission as specified in TS 23.501 [9].

\*\* Unchanged text skipped \*\*

The NG-RAN node shall report to the AMF, in the PDU SESSION RESOURCE MODIFY RESPONSE message, the result for each PDU session requested to be modified listed in the PDU SESSION RESOURCE MODIFY REQUEST message:

- For each PDU session which is successfully modified, the *PDU Session Resource Modify Response Transfer* IE shall be included containing:

1. The list of QoS flows which have been successfully setup or modified, if any, in the *QoS Flow Add or Modify Response List* IE in case the PDU Session Resource Modify procedure is triggered by QoS flow setup or modification.

2. The list of QoS flows which have failed to be setup or modified, if any, in the *QoS Flow Failed to Add or Modify List* IE in case the PDU Session Resource Modify procedure is triggered by QoS flow setup or modification.

- For each PDU session which failed to be modified, the *PDU Session Resource Modify Unsuccessful Transfer* IE shall be included containing the failure cause.

- For each PDU session, if the *DL NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall be considered by the SMF as the new DL transport layer address for the PDU session. The NG-RAN also may indicate the mapping between each new DL transport layer address and the corresponding UL transport layer address assigned by the 5GC.

- For each PDU session, if the *Additional NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall, if supported, be considered by the SMF as the new DL transport layer address(es) for the PDU session. The NG-RAN also may indicate the mapping between each new DL transport layer address and the corresponding UL transport layer address assigned by the 5GC.

- For each PDU session, if the *Additional Redundant NG-U UP TNL Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, it shall, if supported, be considered by the SMF as the new DL transport layer address(es) for the PDU session for the redundant transmission. The NG-RAN also may indicate the mapping between each new redundant DL transport layer address and the corresponding redundant UL transport layer address assigned by the 5GC.

Upon reception of the PDU SESSION RESOURCE MODIFY RESPONSE message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transfer transparently the *PDU Session Resource Modify Response Transfer* IE or *PDU Session Resource Modify Unsuccessful Transfer* IE to each SMF associated with the concerned PDU session.

The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE MODIFY RESPONSE message location information of the UE in the *User Location Information* IE.

For a PDU session or a QoS flow which failed to be modified, the NG-RAN node shall fall back to the configuration of the PDU session or the QoS flow as it was configured prior to the reception of the PDU SESSION RESOURCE MODIFY REQUEST message.

Upon reception of the PDU SESSION RESOURCE MODIFY REQUEST message to setup a QoS flow for IMS voice, if the NG-RAN node is not able to support IMS voice, the NG-RAN node shall initiate EPS fallback or RAT fallback for IMS voice procedure as specified in TS 23.501 [9] and report unsuccessful establishment of the QoS flow in the *PDU Session Resource Modify Response Transfer* IE or in the *PDU Session Resource Modify Unsuccessful Transfer* IE with cause value "IMS voice EPS fallback or RAT fallback triggered".

If the *User Location Information* IE is included in the PDU SESSION RESOURCE MODIFY RESPONSE message, the AMF shall handle this information as specified in TS 23.501 [9].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

For each PDU session for which the *Secondary RAT Usage Information* IE is included in the *PDU Session Resource Modify Response Transfer* IE, the SMF shall handle this information as specified in TS 23.502 [10].

If the *PDU Set QoS Parameters* IE is included in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE MODIFY RESPONSE message the *PDU Set based Handling Indicator* IE in the *PDU Session Resource Modify Response Transfer* IE. If the *PDU Set based Handling Indicator* IE is included in the *PDU Session Resource Modify Response Transfer* IE in the PDU SESSION RESOURCE MODIFY RESPONSE message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

**Interactions with Handover Preparation procedure:**

If a handover becomes necessary during the PDU Session Resource Modify procedure, the NG-RAN node may interrupt the ongoing PDU Session Resource Modify procedure and initiate the Handover Preparation procedure as follows:

1. The NG-RAN node shall send the PDU SESSION RESOURCE MODIFY RESPONSE message in which the NG-RAN node shall indicate, if necessary, all the PDU sessions failed with an appropriate cause value, e.g. "NG intra-system handover triggered", "NG inter-system handover triggered" or "Xn handover triggered".

2. The NG-RAN node shall trigger the handover procedure.

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### 8.4.2 Handover Resource Allocation

#### 8.4.2.1 General

The purpose of the Handover Resource Allocation procedure is to reserve resources at the target NG-RAN node for the handover of a UE. The procedure uses UE-associated signalling.

#### 8.4.2.2 Successful Operation



Figure 8.4.2.2-1: Handover resource allocation: successful operation

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

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

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

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

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

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

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

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

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

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

Upon reception of the *UE History Information* IE, which is included within the *Source to Target Transparent Container* IE of the HANDOVER REQUEST message, the target NG-RAN node shall collect the information defined as mandatory in the *UE History Information* IE and shall, if supported, collect the information defined as optional in the *UE History Information* IE, for as long as the UE stays in one of its cells, and store the collected information to be used for future handover preparations.

Upon receiving the *PDU Session Resource Setup List* IE contained in the HANDOVER REQUEST message, the target NG-RAN node shall behave the same as defined in the PDU Session Resource Setup procedure. The target NG-RAN node shall report to the AMF in the HANDOVER REQUEST ACKNOWLEDGE message the result for each PDU session resource requested to be setup. In particular, for each PDU session resource successfully setup, it shall include the *Handover Request Acknowledge Transfer* IE containing the following information:

- The list of QoS flows which have been successfully established in the *QoS Flow Setup Response List* IE.

- The *Data Forwarding Accepted* IE if the data forwarding for the QoS flow is accepted.

- The list of QoS flows which have failed to be established, if any, in the *QoS Flow Failed to Setup List* IE.

- The UP transport layer information to be used for the PDU session.

- The security result associated to the PDU session.

- The redundant UP transport layer information to be used for the redundant transmission for the PDU session.

- The PDU Set based Handling Indicator if the HANDOVER REQUEST message includes the *PDU Set QoS Parameters* IE.

\*\* Unchanged text skipped \*\*

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### 8.4.4 Path Switch Request

#### 8.4.4.1 General

The purpose of the Path Switch Request procedure is to establish a UE associated signalling connection to the 5GC and, if applicable, to request the switch of the downlink termination point of the NG-U transport bearer towards a new termination point. The procedure uses UE-associated signalling.

#### 8.4.4.2 Successful Operation



Figure 8.4.4.2-1: Path switch request: successful operation

The NG-RAN node initiates the procedure by sending the PATH SWITCH REQUEST message to the AMF. Upon reception of the PATH SWITCH REQUEST message the AMF shall, for each PDU session indicated in the *PDU Session ID* IE, transparently transfer the *Path Switch Request Transfer* IE to the SMF associated with the concerned PDU session.

If the *RRC Resume Cause* IE is included in the PATH SWITCH REQUEST message, the AMF shall, if supported, use it as described in TS 23.502 [10] for User Plane CIoT 5GS Optimisation when the NG-RAN node is an ng-eNB.

If the *RedCap Indication* IE is included in the PATH SWITCH REQUEST message, the AMF shall, if supported, consider the UE as a RedCap UE that was previously served by a E-UTRA cell, and use the IE according to TS 23.501 [9].

After all necessary updates including the UP path switch have been successfully completed in the 5GC for at least one of the PDU session resources included in the PATH SWITCH REQUEST, the AMF shall send the PATH SWITCH REQUEST ACKNOWLEDGE message to the NG-RAN node and the procedure ends.

The list of accepted QoS flows shall be included in the PATH SWITCH REQUEST message within the *Path Switch Request Transfer* IE. The SMF shall handle this information as specified in TS 23.502 [10].

For each PDU session for which the *Additional DL QoS Flow per TNL Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF may use each included UP transport layer information as the downlink termination point for the included associated QoS flows for this PDU session split in different tunnels.

The list of PDU sessions which failed to be setup, if any, shall be included in the PATH SWITCH REQUEST message within the *Path Switch Request Setup Failed Transfer* IE. The AMF shall handle this information as specified in TS 23.502 [10].

For each PDU session for which the *User Plane Security Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall behave as specified in TS 33.501 [13] and may send back the *Security Indication* IE within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message.

For each PDU session for which the *DL NG-U TNL Information Reused* IE set to "true" is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, consider that the DL TNL information contained in the *DL NG-U UP TNL Information* IE has been reused.

For each PDU session for which the *Additional Redundant DL QoS Flow per TNL Information* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF may use each included UP transport layer information as the downlink termination point for the included associated QoS flows for this PDU session split in different tunnels for the redundant transmission.

For each PDU session for which the *Redundant DL NG-U TNL Information Reused* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, consider the included DL transport layer address as the DL transport layer address for the redundant transmission as specified in TS 23.501 [9].

For each PDU session for which the *Global RAN Node ID of Secondary NG-RAN Node* IE is included in the *Path Switch Request Transfer* IE of the PATH SWITCH REQUEST message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

For each PDU session included in the PATH SWITCH REQUEST message, if the *Current QoS Parameters Set Index* IE is included in the *Path Switch Request Transfer* IE the SMF shall consider it as the currently fulfilled QoS parameters set among the alternative QoS parameters for the involved QoS flow.

The NG-RAN node shall, if supported, report in the PATH SWITCH REQUEST message the *PDU Set based Handling Indicator* IE in the *Path Switch Request Transfer* IE. If the *PDU Set based Handling Indicator* IE is included in the *Path Switch Request Transfer* IE in the PATH SWITCH REQUEST message, the SMF shall, if supported, handle this information as specified in TS 23.501 [9].

If the *Security Indication* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall behave as specified in TS 33.501 [13].

If the *UL NG-U UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall store this information and use it as the uplink termination point for the user plane data for this PDU session.

If the *Additional NG-U* *UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall store this information and use the included *UL NG-U UP TNL Information* IE(s) as the uplink termination point(s) of the user plane data for this PDU session split in different tunnel.

If the *Redundant UL NG-U UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information and use it as the uplink termination point for the user plane data for the redundant transmission for this PDU session as specified in TS 23.501 [9].

If the *Additional Redundant NG-U* *UP TNL Information* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information and use the included *UL NG-U UP TNL Information* IE(s) as the uplink termination point(s) of the user plane data for this PDU session split in different tunnel.

If the *CN Packet Delay Budget Downlink* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided CN Packet Delay Budget Downlink if any and use it as specified in TS 23.502 [10].

If the *CN Packet Delay Budget Uplink* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided CN Packet Delay Budget Uplink if any and use it as specified in TS 23.502 [10].

If the *Burst Arrival Time Downlink* IE is included within the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, replace the previously provided value if any and use it as specified in TS 23.502 [10].

If the *Core Network Assistance Information for RRC INACTIVE* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context and use it for the RRC\_INACTIVE state decision and RNA configuration for the UE and RAN paging if any for a UE in RRC\_INACTIVE state, as specified in TS 38.300 [8]. If the *MICO All PLMN* IE is included in the *Core Network Assistance Information* *for RRC INACTIVE* IE the NG-RAN node shall, if supported, consider that the registration area for the UE is the full PLMN and ignore the *TAI List for RRC Inactive* IE. If the *Paging Cause Indication for Voice Service* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store and use it as specified in TS 38.300 [8]. If the *PEIPS Assistance Information* IE is included in the *Core Network Assistance Information for RRC INACTIVE* IE, the NG-RAN node shall, if supported, store it and use it for paging subgrouping the UE in RRC\_INACTIVE state, as specified in TS 38.300 [8].

If the *CN Assisted RAN Parameters Tuning* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node may use it as described in TS 23.501 [9].

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context.

If the *New Security Context Indicator* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall use the information as specified in TS 33.501 [13].

Upon reception of the PATH SWITCH REQUEST ACKNOWLEDGE message the NG-RAN node shall store the received *Security Context* IE in the UE context and the NG-RAN node shall use it as specified in TS 33.501 [13].

If the *UE Security Capabilities* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall handle it accordingly (TS 33.501 [13]).

If the *Redirection for Voice EPS Fallback* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store it and use it in a subsequent decision of EPS fallback for voice as specified in TS 23.502 [10].

If the *PDU Session Resource Released List* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall release the corresponding QoS flows and regard the PDU session(s) indicated in the *PDU Session Resource Released List* IE as being released. The appropriate cause value for each PDU session released is included in the *Path Switch Request Unsuccessful Transfer* IE contained in the PATH SWITCH REQUEST ACKNOWLEDGE message.

If the *SRVCC Operation Possible* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store the content of the received *SRVCC Operation Possible* IE in the UE context and use it as defined in TS 23.216 [31].

If the *Enhanced Coverage Restriction* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *Extended Connected Time* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as described in TS 23.501 [9].

If the *UE Differentiation Information* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store this information in the UE context for further use according to TS 23.501 [9].

If the *NR V2X Services Authorized* IE is contained in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, update its NR V2X services authorization information for the UE accordingly. If the *NR V2X Services Authorized* IE includes one or more IEs set to "not authorized", the NG-RAN node shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant service(s).

If the *LTE V2X Services Authorized* IE is contained in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, update its LTE V2X services authorization information for the UE accordingly. If the *LTE V2X Services Authorized* IE includes one or more IEs set to "not authorized", the NG-RAN node shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant service(s).

If the *NR UE Sidelink Aggregate Maximum Bit Rate* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE’s sidelink communication in network scheduled mode for NR V2X services.

If the *LTE UE Sidelink Aggregate Maximum Bit Rate* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided UE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE’s sidelink communication in network scheduled mode for LTE V2X services.

If the *PC5 QoS Parameters* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as defined in TS 23.287 [33].

If the *CE-mode-B Restricted* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and the *Enhanced Coverage Restriction* IE is not set to "restricted"and the Enhanced Coverage Restriction information stored in the UE context is not set to "restricted", the NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [9].

If the *UE User Plane CIoT Support Indicator* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message the NG-RAN node shall, if supported, store this information in the UE context and consider that User Plane CIoT 5GS Optimisation as specified in TS 23.501 [9] is supported for the UE.

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *UE Radio Capability ID* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.501 [9] and TS 23.502 [10].

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *Alternative QoS Parameters Set List* IE, the NG-RAN node shall, if supported, use it as specified in TS 23.502 [10].

For each PDU session, if the *PDU Session Expected UE Activity Behaviour* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, handle this information as specified in TS 23.501 [9].

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *Management Based MDT PLMN List* IE, the NG-RAN node shall store it in the UE context, and if supported, use it to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [11].

If the PATH SWITCH REQUEST ACKNOWLEDGE message contains the *Management Based MDT PLMN Modification List* IE, the NG-RAN node shall, if supported, use it to overwrite any previously stored management based MDT PLMN list information in the UE context and use the received information to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [11].

If the *Time Synchronisation Assistance Information* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store the information in the UE context and use it as defined in TS 23.501 [9].

If the *5G ProSe Authorized* IE is contained in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, update its ProSe authorization information for the UE accordingly. If the *5G ProSe Authorized* IEincludes one and more IEs set to "not authorized", the NG-RAN node shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant 5G ProSe service(s).

If the *5G ProSe UE PC5 Aggregate Maximum Bit Rate* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported:

- replace the previously provided 5G ProSe UE PC5 Aggregate Maximum Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE’s sidelink communication in network scheduled mode for 5G ProSe services.

If the *5G ProSe PC5 QoS Parameters* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, use it as defined in TS 23.304 [47].

If the *IAB Authorized* IE is contained in the PATH SWITCH REQUEST ACKNOWLEDGE message, the NG-RAN node shall, if supported, store the received IAB Authorization information in the UE context. If the *IAB Authorized* IE is set to "not authorized" for an IAB-MT, the NG-RAN node shall, if supported, initiate actions to ensure that the IAB node will not serve any UE(s).

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

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and set to "single RRC connected state report" and the UE is in RRC\_CONNECTED state, the NG-RAN node shall, if supported, send one RRC INACTIVE TRANSITION REPORT message to the AMF to report the RRC state of the UE.

If the *RRC Inactive Transition Report Request* IE is included in the PATH SWITCH REQUEST ACKNOWLEDGE message and set to "single RRC connected state report" and the UE is in RRC\_INACTIVE state, the NG-RAN node shall, if supported, send to the AMF one RRC INACTIVE TRANSITION REPORT message plus one subsequent RRC INACTIVE TRANSITION REPORT message when the RRC state transitions to RRC\_CONNECTED state.

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

**Interactions with PDU Session Resource Notify procedure:**

If the QoS related parameters (e.g. the *CN Packet Delay Budget Downlink* IE or the *CN Packet Delay Budget Uplink* IE) are included in the *Path Switch Request Acknowledge Transfer* IE of the PATH SWITCH REQUEST ACKNOWLEDGE message, but can not be succesfully accepted by the NG-RAN node, the NG-RAN node should continue to use the old values received from the source NG-RAN node, if any. The NG-RAN node shall, if supported, send the PDU SESSION RESOURCE NOTIFY message to notify the AMF.

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

#### 9.3.1.x PDU Set QoS Parameters

This IE defines the PDU Set QoS Parameters to be applied to a QoS flow.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| PDU Set Packet Delay Budget | O |  | Extended Packet Delay Budget 9.3.1.135 | PDU Set Delay Budget as specified in TS 23.501 [9]. |
| PDU Set Error Rate | O |  | Packet Error Rate  9.3.1.81 | PDU Set Error Rate as specified in TS 23.501 [9]. |
| PDU Set Integrated Handling Information | O |  | ENUMERATED (true, false, …) | PDU Set Integrated Handling Information as specified in TS 23.501 [9]. |

#### 9.3.1.y N6 Jitter Information

This IE indicates the N6 jitter information associated with the Periodicity in downlink.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| N6 Jitter Lower Bound | M |  | INTEGER (-127, 127) | Indicates the lower bound of the N6 jitter. The unit is: 0.5ms. |
| N6 Jitter Upper Bound | M |  | INTEGER (-127, 127) | Indicates the upper bound of the N6 jitter. The unit is: 0.5ms. |

#### 9.3.1.y1 ECN Marking or Congestion Monitoring Request

This IE indicates the NG-RAN node to perform ECN marking or congestion monitoring.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| CHOICE *ECN and Congestion Monitoring Request* | M |  |  |  |
| >*ECN Marking* |  |  |  |  |
| >>ECN Marking Request | M |  | ENUMERATED (ul, dl, both, stop, …) |  |
| >*Congestion Monitoring* |  |  |  |  |
| >>Congestion Monitoring Request | M |  | ENUMERATED (ul, dl, both, stop, …) |  |

Editor’s note: IE name is FFS

9.3.1.y2 ECN Marking or Congestion Monitoring Reporting Status

This IE contains a list of QoS flows with activation status information for ECN marking for L4S at NG-RAN or congestion monitoring reporting.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| **ECN Marking or Congestion Monitoring Reporting Status Item** |  | *1..< maxnoofQoSFlows >* |  |  |
| >QoS Flow Identifier | M |  | 9.3.1.51 |  |
| > Activation Status | M |  | ENUMERATED (active, not Active, ,…) | Indicates whether ECN marking for L4S at NG-RAN or congestion monitoring reporting is active or not active |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |

Editor’s note: IE name is FFS

#### 9.3.1.y3 PDU Set based Handling Indicator

This IE indicates whether PDU Set based Handling is supported for the NG-RAN node.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| PDU Set based Handling Indicator | M |  | ENUMERATED (supported, …) |  |

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

### 9.3.4 SMF Related IEs

#### 9.3.4.1 PDU Session Resource Setup Request Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| PDU Session Aggregate Maximum Bit Rate | O |  | 9.3.1.102 | This IE shall be present when at least one Non-GBR QoS flow is being setup and is ignored otherwise. | YES | reject |
| UL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs. | YES | reject |
| Additional UL NG-U UP TNL Information | O |  | UP Transport Layer Information List  9.3.2.12 | UPF endpoint of the additional NG-U transport bearer(s), for delivery of UL PDUs for split PDU session. | YES | reject |
| Data Forwarding Not Possible | O |  | 9.3.1.63 | This IE may be present in case of HANDOVER REQUEST message and is ignored otherwise. | YES | reject |
| PDU Session Type | M |  | 9.3.1.52 |  | YES | reject |
| Security Indication | O |  | 9.3.1.27 |  | YES | reject |
| Network Instance | O |  | 9.3.1.113 | This IE is ignored if the *Common Network Instance* IE is included. | YES | reject |
| **QoS Flow Setup Request List** |  | *1* |  |  | YES | reject |
| **>QoS Flow Setup Request Item** |  | *1..<maxnoofQoSFlows>* |  |  | - |  |
| >>QoS Flow Identifier | M |  | 9.3.1.51 |  | - |  |
| >>QoS Flow Level QoS Parameters | M |  | 9.3.1.12 |  | - |  |
| >>E-RAB ID | O |  | 9.3.2.3 |  | - |  |
| >>TSC Traffic Characteristics | O |  | 9.3.1.130 | Traffic pattern information associated with the QFI. Details in TS 23.501 [9]. | YES | ignore |
| >>Redundant QoS Flow Indicator | O |  | 9.3.1.134 | This IE indicates whether this QoS flow is requested for the redundant transmission. | YES | ignore |
| >>ECN Marking or Congestion Monitoring Request (name FFS) | O |  | 9.3.1.y1 |  | YES | ignore |
| Common Network Instance | O |  | 9.3.1.120 |  | YES | ignore |
| Direct Forwarding Path Availability | O |  | 9.3.1.64 | This IE may be present in case of inter-system handover and intra-system handover. | YES | ignore |
| Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission. | YES | ignore |
| Additional Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information List  9.3.2.12 | UPF endpoint of the additional NG-U transport bearer(s), for delivery of redundant UL PDUs for split PDU session. | YES | ignore |
| Redundant Common Network Instance | O |  | Common Network Instance  9.3.1.120 |  | YES | ignore |
| Redundant PDU Session Information | O |  | 9.3.1.136 |  | YES | ignore |
| MBS Session Setup Request List | O |  | 9.3.1.211 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |

#### 9.3.4.2 PDU Session Resource Setup Response Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| DL QoS Flow per TNL Information | M |  | QoS Flow per TNL Information  9.3.2.8 | NG-RAN node endpoint of the NG-U transport bearer for delivery of DL PDUs, together with associated QoS flows. | - |  |
| Additional DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows and corresponding to the *Additional UL NG-U UP TNL Information* IE in the *PDU Session Resource Setup Request Transfer* IE. | - |  |
| Security Result | O |  | 9.3.1.59 |  | - |  |
| QoS Flow Failed to Setup List | O |  | QoS Flow List with Cause  9.3.1.13 |  | - |  |
| Redundant DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information  9.3.2.8 | NG-RAN node endpoint of the NG-U transport bearer(s) for delivery of DL PDUs of the indicated Redundant QoS Flow(s) and corresponding to the *Redundant UL NG-U UP TNL Information* IE in the *PDU Session Resource Setup Request Transfer* IE. | YES | ignore |
| Additional Redundant DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of redundant DL PDUs for split PDU session, together with associated QoS flows and corresponding to the *Additional Redundant UL NG-U UP TNL Information* IE in the *PDU Session Resource Setup Request Transfer* IE. | YES | ignore |
| Used RSN Information | O |  | Redundant PDU Session Information  9.3.1.136 |  | YES | ignore |
| Global RAN Node ID of Secondary NG-RAN Node | O |  | Global RAN Node ID  9.3.1.5 |  | YES | ignore |
| MBS Support Indicator | O |  | 9.3.1.210 |  | YES | ignore |
| MBS Session Setup Response List | O |  | 9.3.1.213 |  | YES | ignore |
| MBS Session Failed to Setup List | O |  | 9.3.1.214 |  | YES | ignore |
| ECN Marking or Congestion Monitoring Reporting Status (name FFS) | O |  | 9.3.1.y2 |  | YES | ignore |
| PDU Set based Handling Indicator | O |  | 9.3.1.y3 |  | YES | ignore |

#### 9.3.4.3 PDU Session Resource Modify Request Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| PDU Session Aggregate Maximum Bit Rate | O |  | 9.3.1.102 |  | YES | reject |
| **UL NG-U UP TNL Modify List** |  | *0..1* |  |  | YES | reject |
| **>UL NG-U UP TNL Modify Item** |  | *1..<maxnoofMultiConnectivity>* |  | This IE(s) are included only for modification of an existing tunnel. | - |  |
| >>UL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs. | - |  |
| >>DL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | Identifies the NG-U transport bearer at the NG-RAN node. | - |  |
| >>Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission. | YES | ignore |
| >>Redundant DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | Identifies the NG-U transport bearer at the NG-RAN node for the redundant transmission. | YES | ignore |
| Network Instance | O |  | 9.3.1.113 | This IE is ignored if the *Common Network Instance* IE is included. | YES | reject |
| **QoS Flow Add or Modify Request List** |  | *0..1* |  |  | YES | reject |
| **>QoS Flow Add or Modify Request Item** |  | *1..<maxnoofQoSFlows>* |  |  | - |  |
| >>QoS Flow Identifier | M |  | 9.3.1.51 |  | - |  |
| >>QoS Flow Level QoS Parameters | O |  | 9.3.1.12 |  | - |  |
| >>E-RAB ID | O |  | 9.3.2.3 |  | - |  |
| >>TSC Traffic Characteristics | O |  | 9.3.1.130 | Traffic pattern information associated with the QFI. Details in TS 23.501 [9]. | YES | ignore |
| >>Redundant QoS Flow Indicator | O |  | 9.3.1.134 | This IE indicates whether this QoS flow is requested for the redundant transmission. | YES | ignore |
| >>ECN Marking or Congestion Monitoring Request (name FFS) | O |  | 9.3.1.y1 |  | YES | ignore |
| QoS Flow to Release List | O |  | QoS Flow List with Cause  9.3.1.13 |  | YES | reject |
| Additional UL NG-U UP TNL Information | O |  | UP Transport Layer Information List  9.3.2.12 | UPF endpoint of the additional NG-U transport bearer(s) proposed for delivery of UL PDUs for split PDU session. | YES | reject |
| Common Network Instance | O |  | 9.3.1.120 |  | YES | ignore |
| Additional Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information List  9.3.2.12 | UPF endpoint of the additional NG-U transport bearer(s) proposed for delivery of redundant UL PDUs for split PDU session. | YES | ignore |
| Redundant Common Network Instance | O |  | Common Network Instance  9.3.1.120 |  | YES | ignore |
| Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | UPF endpoint of the NG-U transport bearer, for delivery of UL PDUs for the redundant transmission of the Redundant QoS Flow(s). | YES | ignore |
| Security Indication | O |  | 9.3.1.27 |  | YES | ignore |
| MBS Session Setup or Modify Request List | O |  | 9.3.1.212 |  | YES | ignore |
| MBS Session To Release List | O |  | 9.3.1.215 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |
| maxnoofMultiConnectivity | Maximum no. of connectivity allowed for a UE. Value is 4. The current version of the specification supports up to 2 connectivity. |

#### 9.3.4.4 PDU Session Resource Modify Response Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs. | - |  |
| UL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | Identifies the NG-U transport bearer at the 5GC node. | - |  |
| **QoS Flow Add or Modify Response List** |  | *0..1* |  |  | - |  |
| **>QoS Flow Add or Modify Response Item** |  | *1..<maxnoofQoSFlows>* |  |  | - |  |
| >>QoS Flow Identifier | M |  | 9.3.1.51 |  | - |  |
| >>Current QoS Parameters Set Index | O |  | Alternative QoS Parameters Set Index  9.3.1.152 | Index to the currently fulfilled alternative QoS parameters set | YES | Ignore |
| Additional DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows. | - |  |
| QoS Flow Failed to Add or Modify List | O |  | QoS Flow List with Cause  9.3.1.13 |  | - |  |
| Additional NG-U UP TNL Information | O |  | UP Transport Layer Information Pair List  9.3.2.11 | NG-RAN node endpoint of the NG-U transport bearer corresponding to the modified UPF endpoint received in the *PDU Session Resource Modify Request Transfer* IE in case of PDU session split. | YES | ignore |
| Redundant DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs for the redundant transmission. | YES | ignore |
| Redundant UL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | Identifies the NG-U transport bearer at the 5GC node for the redundant transmission. | YES | ignore |
| Additional Redundant DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of redundant DL PDUs for split PDU session, together with associated QoS flows. | YES | ignore |
| Additional Redundant NG-U UP TNL Information | O |  | UP Transport Layer Information Pair List  9.3.2.11 | NG-RAN node endpoint of the NG-U transport bearer for delivery of redundant DL PDUs corresponding to the modified UPF endpoint(s) received in the *UL NG-U UP TNL Modify List* IE of the *PDU Session Resource Modify Request Transfer* IE in case of PDU session split. | YES | ignore |
| Secondary RAT Usage Information | O |  | 9.3.1.114 |  | YES | ignore |
| MBS Support Indicator | O |  | 9.3.1.210 |  | YES | ignore |
| MBS Session Setup or Modify Response List | O |  | MBS Session Setup Response List  9.3.1.213 |  | YES | ignore |
| MBS Session Failed to Setup or Modify List | O |  | MBS Session Failed to Setup List  9.3.1.214 |  | YES | ignore |
| ECN Marking or Congestion Monitoring Reporting Status (name FFS) | O |  | 9.3.1.y2 |  | YES | ignore |
| PDU Set based Handling Indicator | O |  | 9.3.1.y3 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

#### 9.3.4.8 Path Switch Request Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| DL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs. | - |  |
| DL NG-U TNL Information Reused | O |  | ENUMERATED (true, …) | Indicates that DL NG-U TNL Information has been reused. | - |  |
| User Plane Security Information | O |  | 9.3.1.60 |  | - |  |
| **QoS Flow Accepted List** |  | *1* |  | QoS flows associated with the *DL NG-U UP TNL Information* IE. | - |  |
| **>QoS Flow Accepted Item** |  | *1..<maxnoofQoSFlows>* |  |  | - |  |
| >>QoS Flow Identifier | M |  | 9.3.1.51 |  | - |  |
| >>Current QoS Parameters Set Index | O |  | Alternative QoS Parameters Set Index  9.3.1.152 | Index to the currently fulfilled alternative QoS parameters set. | YES | ignore |
| Additional DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of DL PDUs for split PDU session, together with associated QoS flows. | YES | ignore |
| Redundant DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of redundant DL PDUs. | YES | ignore |
| Redundant DL NG-U TNL Information Reused | O |  | ENUMERATED (true, …) | Indicates that Redundant DL NG-U TNL Information has been reused. | YES | ignore |
| Additional Redundant DL QoS Flow per TNL Information | O |  | QoS Flow per TNL Information List  9.3.2.1 | NG-RAN node endpoint of the additional NG-U transport bearer(s) for delivery of Redundant DL PDUs for split PDU session, together with associated QoS flows. | YES | ignore |
| Used RSN Information | O |  | Redundant PDU Session Information  9.3.1.136 |  | YES | ignore |
| Global RAN Node ID of Secondary NG-RAN Node | O |  | Global RAN Node ID  9.3.1.5 |  | YES | ignore |
| MBS Support Indicator | O |  | 9.3.1.210 |  | YES | ignore |
| PDU Set based Handling Indicator | O |  | 9.3.1.y3 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

#### 9.3.4.11 Handover Request Acknowledge Transfer

This IE is transparent to the AMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| DL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs. | - |  |
| DL Forwarding UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | To deliver forwarded DL PDUs. | - |  |
| Security Result | O |  | 9.3.1.59 |  | - |  |
| QoS Flow Setup Response List | M |  | QoS Flow List with Data Forwarding 9.3.2.13 | QoS flows associated with the *DL NG-U UP TNL Information* IE. | - |  |
| QoS Flow Failed to Setup List | O |  | QoS Flow List with Cause  9.3.1.13 |  | - |  |
| Data Forwarding Response DRB List | O |  | 9.3.1.77 |  | - |  |
| **Additional DL UP TNL Information for HO List** |  | *0..1* |  |  | YES | ignore |
| **>Additional DL UP TNL Information for HO Item** |  | *1..<maxnoofMultiConnectivityMinusOne>* |  | Additional DL UP TNL Information for split PDU session, in the same order as the UPF endpoint of the additional NG-U transport bearer(s) received in the *Handover Request Transfer* IE of the Handover Request message. | - |  |
| >>Additional DL NG-U UP TNL Information | M |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the additional NG-U transport bearer for delivery of DL PDUs. | - |  |
| >>Additional QoS Flow Setup Response List | M |  | QoS Flow List with Data Forwarding 9.3.2.13 | QoS flows associated with the *Additional* *DL NG-U UP TNL Information* IE. | - |  |
| >>Additional DL Forwarding UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint to deliver forwarded DL PDUs. | - |  |
| >>Additional Redundant DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the additional NG-U transport bearer for delivery of redundant DL PDUs. | YES | ignore |
| UL Forwarding UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | To deliver forwarded UL PDUs | YES | reject |
| Additional UL Forwarding UP TNL Information | O |  | UP Transport Layer Information List  9.3.2.12 | NG-RAN node endpoint to deliver forwarded UL PDUs for split PDU session. | YES | reject |
| Data Forwarding Response E-RAB List | O |  | 9.3.1.121 |  | YES | ignore |
| Redundant DL NG-U UP TNL Information | O |  | UP Transport Layer Information  9.3.2.2 | NG-RAN node endpoint of the NG-U transport bearer, for delivery of DL PDUs for the redundant transmission. | YES | ignore |
| Used RSN Information | O |  | Redundant PDU Session Information  9.3.1.136 |  | YES | ignore |
| Global RAN Node ID of Secondary NG-RAN Node | O |  | Global RAN Node ID  9.3.1.5 |  | YES | ignore |
| MBS Support Indicator | O |  | 9.3.1.210 |  | YES | ignore |
| PDU Set based Handling Indicator | O |  | 9.3.1.y3 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |
| maxnoofMultiConnectivityMinusOne | Maximum no. of connectivity allowed for a UE minus one. Value is 3. The current version of the specification supports 1. |

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

### 9.4.5 Information Element Definitions

-- ASN1START

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

--

-- Information Element Definitions

--

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

NGAP-IEs {

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

id-AdditionalDLForwardingUPTNLInformation,

id-AdditionalULForwardingUPTNLInformation,

id-AdditionalDLQosFlowPerTNLInformation,

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

id-BeamMeasurementsReportConfiguration,

id-TAI,

id-HFCNode-ID-new,

id-GlobalCable-ID-new,

id-PDUsetQoSParameters,

id-PDUSetbasedHandlingIndicator,

id-N6JitterInformation,

id-ECNMarkingCongestionMonitoringRequest,

id-ECNMarkingCongestionMonitoringReportingStatus,

maxnoofAllowedAreas,

maxnoofAllowedCAGsperPLMN,

maxnoofAllowedS-NSSAIs,

maxnoofBluetoothName,

maxnoofBPLMNs,

maxnoofCAGSperCell,

maxnoofCandidateCells,

maxnoofCellIDforMDT,

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

-- E

EarlyMeasurement ::= ENUMERATED {true, ...}

EarlyStatusTransfer-TransparentContainer ::= SEQUENCE {

procedureStage ProcedureStageChoice,

iE-Extensions ProtocolExtensionContainer { {EarlyStatusTransfer-TransparentContainer-ExtIEs} } OPTIONAL,

...

}

EarlyStatusTransfer-TransparentContainer-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

ProcedureStageChoice ::= CHOICE {

first-dl-count FirstDLCount,

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

}

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

...

}

FirstDLCount ::= SEQUENCE {

dRBsSubjectToEarlyStatusTransfer DRBsSubjectToEarlyStatusTransfer-List,

iE-Extension ProtocolExtensionContainer { {FirstDLCount-ExtIEs} } OPTIONAL,

...

}

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

...

}

DRBsSubjectToEarlyStatusTransfer-List ::= SEQUENCE (SIZE (1.. maxnoofDRBs)) OF DRBsSubjectToEarlyStatusTransfer-Item

DRBsSubjectToEarlyStatusTransfer-Item ::= SEQUENCE {

dRB-ID DRB-ID,

firstDLCOUNT DRBStatusDL,

iE-Extension ProtocolExtensionContainer { { DRBsSubjectToEarlyStatusTransfer-Item-ExtIEs} } OPTIONAL,

...

}

DRBsSubjectToEarlyStatusTransfer-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

ECNMarkingCongestionMonitoringRequest ::= CHOICE {

eCNMarkingRequest ECNMarkingRequest,

congestionMonitoringRequest CongestionMonitoringRequest,

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

}

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

...

}

ECNMarkingRequest ::= ENUMERATED {ul, dl, both, stop, ...}

CongestionMonitoringRequest ::= ENUMERATED {ul, dl, both, stop, ...}

ECNMarkingCongestionMonitoringReportingStatus ::= SEQUENCE (SIZE (1..maxnoofQosFlows)) OF ECNMarkingCongestionMonitoringReportingStatus-Item

ECNMarkingCongestionMonitoringReportingStatus-Item ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

activationStatus ActivationStatus,

iE-Extension ProtocolExtensionContainer { { ECNMarkingCongestionMonitoringReportingStatus-Item-ExtIEs} } OPTIONAL,

...

}

ECNMarkingCongestionMonitoringReportingStatus-Item-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

ActivationStatus ::= ENUMERATED {

active,

not-active,

...

}

EDT-Session ::= ENUMERATED {

true,

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

HandoverPreparationUnsuccessfulTransfer ::= SEQUENCE {

cause Cause,

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

...

}

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

...

}

HandoverRequestAcknowledgeTransfer ::= SEQUENCE {

dL-NGU-UP-TNLInformation UPTransportLayerInformation,

dLForwardingUP-TNLInformation UPTransportLayerInformation OPTIONAL,

securityResult SecurityResult OPTIONAL,

qosFlowSetupResponseList QosFlowListWithDataForwarding,

qosFlowFailedToSetupList QosFlowListWithCause OPTIONAL,

dataForwardingResponseDRBList DataForwardingResponseDRBList OPTIONAL,

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

...

}

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

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

{ ID id-ULForwardingUP-TNLInformation CRITICALITY reject EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-AdditionalULForwardingUPTNLInformation CRITICALITY reject EXTENSION UPTransportLayerInformationList PRESENCE optional }|

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

{ ID id-RedundantDL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

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

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

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

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

...

}

HandoverRequiredTransfer ::= SEQUENCE {

directForwardingPathAvailability DirectForwardingPathAvailability OPTIONAL,

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

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

-- N

N3IWF-ID ::= CHOICE {

n3IWF-ID BIT STRING (SIZE(16)),

choice-Extensions ProtocolIE-SingleContainer { {N3IWF-ID-ExtIEs} }

}

N3IWF-ID-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

N6JitterInformation ::= SEQUENCE {

n6JitterLowerBound INTEGER (-127, 127),

n6JitterUpperBound INTEGER (-127, 127),

iE-Extensions ProtocolExtensionContainer { { N6JitterInformation-ExtIEs} } OPTIONAL,

...

}

N6JitterInformation-ExtIEs NGAP-PROTOCOL-IES ::= {

...

}

NAS-PDU ::= OCTET STRING

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

PathSwitchRequestSetupFailedTransfer ::= SEQUENCE {

cause Cause,

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

...

}

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

...

}

PathSwitchRequestTransfer ::= SEQUENCE {

dL-NGU-UP-TNLInformation UPTransportLayerInformation,

dL-NGU-TNLInformationReused DL-NGU-TNLInformationReused OPTIONAL,

userPlaneSecurityInformation UserPlaneSecurityInformation OPTIONAL,

qosFlowAcceptedList QosFlowAcceptedList,

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

...

}

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

{ ID id-AdditionalDLQosFlowPerTNLInformation CRITICALITY ignore EXTENSION QosFlowPerTNLInformationList PRESENCE optional }|

{ ID id-RedundantDL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-RedundantDL-NGU-TNLInformationReused CRITICALITY ignore EXTENSION DL-NGU-TNLInformationReused PRESENCE optional }|

{ ID id-AdditionalRedundantDLQosFlowPerTNLInformation CRITICALITY ignore EXTENSION QosFlowPerTNLInformationList PRESENCE optional }|

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

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

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

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

...

}

PathSwitchRequestUnsuccessfulTransfer ::= SEQUENCE {

cause Cause,

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

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

PDUSessionResourceModifyResponseTransfer ::= SEQUENCE {

dL-NGU-UP-TNLInformation UPTransportLayerInformation OPTIONAL,

uL-NGU-UP-TNLInformation UPTransportLayerInformation OPTIONAL,

qosFlowAddOrModifyResponseList QosFlowAddOrModifyResponseList OPTIONAL,

additionalDLQosFlowPerTNLInformation QosFlowPerTNLInformationList OPTIONAL,

qosFlowFailedToAddOrModifyList QosFlowListWithCause OPTIONAL,

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

...

}

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

{ ID id-AdditionalNGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformationPairList PRESENCE optional }|

{ ID id-RedundantDL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-RedundantUL-NGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformation PRESENCE optional }|

{ ID id-AdditionalRedundantDLQosFlowPerTNLInformation CRITICALITY ignore EXTENSION QosFlowPerTNLInformationList PRESENCE optional }|

{ ID id-AdditionalRedundantNGU-UP-TNLInformation CRITICALITY ignore EXTENSION UPTransportLayerInformationPairList PRESENCE optional }|

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

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

{ ID id-MBSSessionSetuporModifyResponseList CRITICALITY ignore EXTENSION MBSSessionSetupResponseList PRESENCE optional }|

{ ID id-MBSSessionFailedtoSetuporModifyList CRITICALITY ignore EXTENSION MBSSessionFailedtoSetupList PRESENCE optional }|

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

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

...

}

PDUSessionResourceModifyIndicationTransfer ::= SEQUENCE {

dLQosFlowPerTNLInformation QosFlowPerTNLInformation,

additionalDLQosFlowPerTNLInformation QosFlowPerTNLInformationList OPTIONAL,

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

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

PDUSessionResourceSetupResponseTransfer ::= SEQUENCE {

dLQosFlowPerTNLInformation QosFlowPerTNLInformation,

additionalDLQosFlowPerTNLInformation QosFlowPerTNLInformationList OPTIONAL,

securityResult SecurityResult OPTIONAL,

qosFlowFailedToSetupList QosFlowListWithCause OPTIONAL,

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

...

}

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

{ ID id-RedundantDLQosFlowPerTNLInformation CRITICALITY ignore EXTENSION QosFlowPerTNLInformation PRESENCE optional }|

{ ID id-AdditionalRedundantDLQosFlowPerTNLInformation CRITICALITY ignore EXTENSION QosFlowPerTNLInformationList PRESENCE optional }|

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

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

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

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

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

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

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

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

PDUSessionUsageReport ::= SEQUENCE {

rATType ENUMERATED {nr, eutra, ..., nr-unlicensed, e-utra-unlicensed},

pDUSessionTimedReportList VolumeTimedReportList,

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

...

}

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

...

}

PDUsetQoSParameters ::= SEQUENCE {

pduSetDelayBudget ExtendedPacketDelayBudget OPTIONAL,

pduSetErrorRate PacketErrorRate OPTIONAL,

pduSetIntegratedHandlingInformation ENUMERATED {true, false, ...} OPTIONAL,

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

}

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

...

}

PDUSetbasedHandlingIndicator ::= ENUMERATED {supported, ...}

PEIPSassistanceInformation ::= SEQUENCE {

cNsubgroupID CNsubgroupID,

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

...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

QosFlowLevelQosParameters ::= SEQUENCE {

qosCharacteristics QosCharacteristics,

allocationAndRetentionPriority AllocationAndRetentionPriority,

gBR-QosInformation GBR-QosInformation OPTIONAL,

reflectiveQosAttribute ReflectiveQosAttribute OPTIONAL,

additionalQosFlowInformation AdditionalQosFlowInformation OPTIONAL,

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

...

}

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

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

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

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

...

}

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

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

QosFlowAddOrModifyRequestList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAddOrModifyRequestItem

QosFlowAddOrModifyRequestItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

qosFlowLevelQosParameters QosFlowLevelQosParameters OPTIONAL,

e-RAB-ID E-RAB-ID OPTIONAL,

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

...

}

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

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

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

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

...

}

QosFlowAddOrModifyResponseList ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowAddOrModifyResponseItem

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

QosFlowSetupRequestItem ::= SEQUENCE {

qosFlowIdentifier QosFlowIdentifier,

qosFlowLevelQosParameters QosFlowLevelQosParameters,

e-RAB-ID E-RAB-ID OPTIONAL,

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

...

}

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

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

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

{ID id-ECNMarkingCongestionMonitoringRequest CRITICALITY ignore EXTENSION ECNMarkingCongestionMonitoringRequest PRESENCE optional }

,

...

}

QosFlowListWithDataForwarding ::= SEQUENCE (SIZE(1..maxnoofQosFlows)) OF QosFlowItemWithDataForwarding

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

TSCAssistanceInformation ::= SEQUENCE {

periodicity Periodicity,

burstArrivalTime BurstArrivalTime OPTIONAL,

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

...

}

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

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

{ ID id-N6JitterInformation CRITICALITY ignore EXTENSION N6JitterInformation PRESENCE optional},

...

}

TSCTrafficCharacteristics ::= SEQUENCE {

tSCAssistanceInformationDL TSCAssistanceInformation OPTIONAL,

tSCAssistanceInformationUL TSCAssistanceInformation OPTIONAL,

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

...

}

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

### 9.4.7 Constant Definitions

-- ASN1START

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

--

-- Constant definitions

--

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

NGAP-Constants {

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

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

id-BeamMeasurementsReportConfiguration ProtocolIE-ID ::= 361

id-HFCNode-ID-new ProtocolIE-ID ::= 362

id-GlobalCable-ID-new ProtocolIE-ID ::= 363

id-TargetHomeENB-ID ProtocolIE-ID ::= 364

id-HashedUEIdentityIndexValue ProtocolIE-ID ::= 365

id-ExtendedMobilityInformation ProtocolIE-ID ::= 366

id-PDUsetQoSParameters ProtocolIE-ID ::= a1

id-PDUSetbasedHandlingIndicator ProtocolIE-ID ::= a5

id-N6JitterInformation ProtocolIE-ID ::= a2

id-ECNMarkingCongestionMonitoringRequest ProtocolIE-ID ::= a3

id-ECNMarkingCongestionMonitoringReportingStatus ProtocolIE-ID ::= a4

END

-- ASN1STOP

<<<<<<<<<<<<<<<<<<<< End of Changes >>>>>>>>>>>>>>>>>>>>