**3GPP RAN WG3 Meeting #120 R3-234656**

**Toulouse, France, 21 – 25 Aug, 2023**

**Agenda Item: 25.2**

**Source: Ericsson**

**Title: (TP to TS 38.423 BL CR) Addition of PDU Set QoS Parameters**

**Document for: Other**

TP to XnAP BL CR

***------Start of the first change-------***

8.2.1 Handover Preparation

8.2.1.1 General

This procedure is used to establish necessary resources in an NG-RAN node for an incoming handover. If the procedure concerns a conditional handover, parallel transactions are allowed. Possible parallel requests are identified by the target cell ID when the source UE AP IDs are the same.

The procedure uses UE-associated signalling.

8.2.1.2 Successful Operation

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**Figure 8.2.1.2-1: Handover Preparation, successful operation**

The source NG-RAN node initiates the procedure by sending the HANDOVER REQUEST message to the target NG-RAN node. When the source NG-RAN node sends the HANDOVER REQUEST message, it shall start the timer TXnRELOCprep.

***------Skipped text unchanged-------***

For each QoS flow which has been successfully established in the target NG-RAN node, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the HANDOVER REQUEST message, the target 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 HANDOVER REQUEST message, the target NG-RAN node shall store this information, and shall, if supported, use it for RAN part delay reporting. 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 Resources To Be Setup List* IE, the target NG-RAN node shall, if supported, use it as specified in TS 23.501 [7].

***------Next change-------***

8.2.4 Retrieve UE Context

8.2.4.1 General

The purpose of the Retrieve UE Context procedure is to either retrieve the UE context from the old NG-RAN node and transfer it to the NG-RAN node where the UE RRC Connection has been requested to be established, or to enable the old NG-RAN node to forward an RRC message to the UE via the new NG-RAN node without context transfer, or to request for small data transmission.

The procedure uses UE-associated signalling.

8.2.4.2 Successful Operation

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**Figure 8.2.4.2-1: Retrieve UE Context, successful operation**

The new NG-RAN node initiates the procedure by sending the RETRIEVE UE CONTEXT REQUEST message to the old NG-RAN node.

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For each QoS flow in the RETRIEVE UE CONTEXT RESPONSE message, if the *QoS Monitoring Request* IE is included in the *QoS Flow Level QoS Parameters* IE in the *PDU Session Resources To Be Setup List* IE, the new 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 is included in the *QoS Flow Level QoS Parameters* IE in the *PDU Session Resources To Be Setup List* IE, the new NG-RAN node shall store this information, and shall, if supported, use it for RAN part delay reporting. 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 Resources To Be Setup List* IE, the new NG-RAN node shall, if supported, use it as specified in TS 23.501 [7].

***------Next change-------***

9.2.1.1 PDU Session Resources To Be Setup List

This IE contains PDU session resource related information used at UE context transfer between NG-RAN nodes.

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| **PDU Session Resources To Be Setup List** |  | *1* |  |  | – |  |
| **>PDU Session Resources To Be Setup Item** |  | *1 .. <maxnoof PDU sessions >* |  |  | – |  |
| >>PDU Session ID | M |  | 9.2.3.18 |  | – |  |
| >>S-NSSAI | M |  | 9.2.3.21 |  | – |  |
| >>PDU Session Resource Aggregate Maximum Bitrate | O |  | PDU Session Aggregate Maximum Bit Rate  9.2.3.69 | This IE shall be present when at least one Non-GBR QoS Flow has been setup. | – |  |
| >>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 | – |  |
| >>Source DL NG-U TNL Information | O |  | UP Transport Layer Information 9.2.3.30 | Indicates the possibility to keep the NG-U GTP-U tunnel termination point at the target NG-RAN node. | – |  |
| >>Security Indication | O |  | 9.2.3.52 |  | – |  |
| >>PDU Session Type | M |  | 9.2.3.19 |  | – |  |
| >>Network Instance | O |  | 9.2.3.85 | This IE is ignored if the *Common Network Instance* IE is present. | – |  |
| **>>QoS Flows To Be Setup List** |  | *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 |  | – |  |
| >>>>E-RAB ID | O |  | INTEGER (0..15, …) |  | – |  |
| >>>>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 |
| >>Data Forwarding and Offloading Info from source NG-RAN node | O |  | 9.2.1.17 |  | – |  |
| >>Additional UL NG-U UP TNL Information at UPF List | O |  | Additional UP Transport Layer Information 9.2.1.32 | Additional UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs | YES | ignore |
| >> Common Network Instance | O |  | 9.2.3.92 |  | 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 |
| >>Additional Redundant UL NG-U UP TNL Information at UPF List | O |  | Additional UP Transport Layer Information 9.2.1.32 | Additional Redundant UPF endpoint of the NG-U transport bearer. For delivery of UL PDUs | 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 |
| >>MBS Session Associated Information | O |  | 9.2.1.37 |  | YES | ignore |

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| **Range bound** | **Explanation** |
| maxnoofPDUSessions | Maximum no. of PDU sessions. Value is 256 |
| maxnoofQoSFlows | Maximum no. of QoS flows allowed within one PDU session. Value is 64. |

***------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 |
| 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 |

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

***------Next change-------***

9.2.1.7 PDU Session Resource Setup Info – MN terminated

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

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| PDU Session Type | M |  | 9.2.3.19 |  | – |  |
| **DRBs To Be Setup List** |  | *1* |  |  | – |  |
| **>DRBs to Be Setup Item** |  | *1 .. <maxnoofDRBs>* |  |  | – |  |
| >>DRB ID | M |  | 9.2.3.33 |  | – |  |
| >>MN UL PDCP UP TNL Information | M |  | UP Transport Parameters 9.2.3.76 | M-NG-RAN node endpoint(s) of a DRB’s Xn-U transport bearer at its PDCP resource. For delivery of UL PDUs. | – |  |
| >>RLC Mode | M |  | 9.2.3.28 | Indicates the RLC mode to be used in the assisting node. | – |  |
| >>UL Configuration | O |  | 9.2.3.75 | Information about UL usage in the S-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. | – |  |
| >>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. | – |  |
| >>secondary MN UL PDCP UP TNL Information | O |  | UP Transport Parameters 9.2.3.76 | M-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. | – |  |
| **>>QoS Flows Mapped To DRB List** |  | *1* |  |  | – |  |
| **>>>QoS Flows Mapped To DRB Item** |  | *1 .. <maxnoofQoSFlows>* |  |  | – |  |
| >>>>QoS Flow Identifier | M |  | 9.2.3.10 |  | – |  |
| >>>>QoS Flow Level QoS Parameters | M |  | 9.2.3.5 |  | – |  |
| >>>>QoS Flow Mapping Indication | O |  | 9.2.3.79 |  | – |  |
| >>>>TSC Traffic Characteristics | O |  | 9.2.3.114 | Traffic pattern information associated with the QFI. Details in TS 23.501 [7]. | 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 Parameters 9.2.3.76 | M-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 |

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

***------Next change-------***

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 |
| 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 |
| 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 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 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 |

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

***------Next change-------***

9.2.3.5 QoS Flow Level QoS Parameters

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

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| CHOICE *QoS Characteristics* | M |  |  |  | – |  |
| >*Non Dynamic 5QI* |  |  |  |  |  |  |
| >>Non dynamic 5QI Descriptor | M |  | 9.2.3.8 |  | – |  |
| >*Dynamic 5QI* |  |  |  |  |  |  |
| >>Dynamic 5QI Descriptor | M |  | 9.2.3.9 |  | – |  |
| Allocation and Retention Priority | M |  | 9.2.3.7 |  | – |  |
| GBR QoS Flow Information | O |  | 9.2.3.6 | This IE shall be present for GBR QoS flows and is ignored otherwise. | – |  |
| Reflective QoS Attribute | O |  | ENUMERATED (subject to, ...) | Reflective QoS is specified in TS 23.501 [7]. This IE applies to Non-GBR bearers only and is ignored otherwise. | – |  |
| Additional QoS flow Information | O |  | ENUMERATED (more likely, …) | If this IE is set to "more likely", this indicates that traffic for this QoS flow is likely to appear more often than traffic for other flows established for the PDU session. This IE may be present in case of Non-GBR flows only and is ignored otherwise. | – |  |
| QoS Monitoring Request | O |  | ENUMERATED (UL, DL, Both, …) | Indicates to measure UL, or DL, or both UL/DL delays for the associated QoS flow. | YES | ignore |
| QoS Monitoring Reporting Frequency | O |  | INTEGER (1.. 1800, …) | Indicates the Reporting Frequency for RAN part delay for Qos monitoring.  Unit: second | YES | ignore |
| QoS Monitoring Disabled | O |  | ENUMERATED(true, ...) | Indicates to stop the QoS monitoring. | YES | ignore |
| PDU Set QoS Parameters | O |  | 9.2.3.X | Indicates the PDU Set QoS Parameters. | YES | ignore |

***------Next change-------***

9.2.3.115 TSC Assistance Information

This IE provides the TSC assistance information for a TSC QoS flow in the uplink or downlink (see TS 23.501 [7]).

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| Periodicity | M |  | 9.2.3.116 | Periodicity as specified in TS 23.501 [7]. | – |  |
| Burst Arrival Time | O |  | 9.2.3.117 | Burst Arrival Time as specified in TS 23.501 [7]. | – |  |
| Survival Time | O |  | 9.2.3.152 |  | YES | ignore |
| N6 Jitter Information | O |  | 9.2.3.Y |  | YES | ignore |

***------Next change-------***

9.2.3.X PDU Set QoS Parameters

This IE provides the PDU Set QoS Parameters (see TS 23.501 [7]).

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| --- | --- | --- | --- | --- |
| PDU Set Delay Budget | O |  | Extended Packet Delay Budget  9.2.3.113 | Upper bound for the delay that a PDU Set may experience for the transfer between the UE and the N6 termination point at the UPF, as defined in TS 23.501 [7]. |
| PDU Set Error Rate | O |  | Packet Error Rate 9.2.3.13 | Upper bound for a rate of non-congestion related PDU Set losses, as defined in TS 23.501 [7]. |
| PDU Set Integrated Handling Information | O |  | ENUMERATED(true, false, …) | Indicates whether all PDUs of the PDU Set are needed for the usage of the PDU Set by the application layer in the receiver side, as defined in TS 23.501 [7]. |

9.2.3.Y N6 Jitter Information

This IE indicates the jitter information.

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| --- | --- | --- | --- | --- |
| N6 Jitter Information | M |  | INTEGER(FFS – Pending RAN2) | Indicates the jitter information associated with the Periodicity in downlink, as defined in TS 23.501[7]. |

***------Next change-------***

ASN.1 to be provided later

***------Next change-------***