**3GPP TSG-RAN WG3 Meeting #115-e *R3-22xxxx***

**E-meeting, 21 Feb – 3 Mar 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.425** | **CR** | **0129** | **rev** | **1** | **Current version:** | 16.3.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Assistance information for UL duplication [UL\_duplication] | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, China Unicom, China Telecom, CATT | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2022-02-21 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In Rel-16 IIOT WI, it was agreed that “RAN3 will not introduce the network coordination in this release”.  Currenlty in Rel-17, it is benefical to introduce the UL assistance information between RAN nodes, so that each node can control all Secondary RLC entities either at the MN or at the SN side based on the UL assistance information.  In order to do this, there is need to exchange the UL radio channel conditions in between. | | | | | | | | |
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| ***Summary of change:*** | | In the ASSISTANCE INFORMATION DATA (PDU Type 2) frame:   * Add UL Assistance Info. Ind per RLC, UL PDCP Duplication Activation Flag and LCH ID   In the DL USER DATA (PDU Type 0) frame:   * Add the Radio Quality Assistance Information, UL PDCP Duplication Activation Flag and LCH ID | | | | | | | | |
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| ***Consequences if not approved:*** | | The UL duplication is not fully supported for the multi-connectivity scenario. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.4.1, 5.4.3, 5.5.2.1, 5.5.2.3, 5.5.3.Y, 5.5.3.Z | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev0: R3-215137  Rev1: R3-221958  Rev2: R3-22xxxx  Merge R3-222217 and R3-221940. | | | | | | | | |

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| **Change Begins** |

### 5.4.1 Transfer of Downlink User Data

#### 5.4.1.1 Successful operation

<Unchanged Text Omitted>

If the User data existence flag is set to 1, the corresponding node assumes that the node hosting the NR PDCP entity has some user data for the concerned data radio bearer. The corresponding node decides whether and when to use DRX for the UE (i.e. the corresponding node may indicate the UE to use DRX even if the flag is set to 1 and the received DL USER DATA frame contains no user data).

The node hosting the NR PDCP entity may indicate to the corresponding node the Radio Quality Assistance Information, the Logical Channel ID, or the the UL duplication activation flag. The corresponding node shall, if supported, take this information into account for UL packet duplication.

<Unchanged Text Omitted>

### 5.4.3 Transfer of Assistance Information

#### 5.4.3.1 Successful operation

<Unchanged Text Omitted>

The ASSISTANCE INFORMATION DATA frame may include the UL Delay or/and DL Delay measured by the corresponding node. The node hosting the NR PDCP entity may take this information into account to calculate the whole UL or/and DL delay of RAN.

The ASSISTANCE INFORMATION DATA frame may include the Logical Channel ID, the Radio Quality Assistance Information, or the duplication activation flag. The node hosting the NR PDCP entity shall, if supported, take this information into account for UL packet duplication.

<Unchanged Text Omitted>

#### 5.5.2.1 DL USER DATA (PDU Type 0)

This frame format is defined to allow the corresponding node to detect lost NR-U packets and is associated with the transfer of a Downlink NR PDCP PDU.

The following shows the respective DL USER DATA frame.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | | | Number of Octets |
| 7 | 6 | 5 | | 4 | 3 | 2 | 1 | 0 |
| PDU Type (=0) | | | | | UL PDCPDupl. Ind | DL Discard Blocks | DL Flush | Report polling | 1 |
| Spare | | | UL PDCP Dupl. assistance Info. Ind | Request OutofSeq Report | Report Delivered | User data existence flag | Assistance Info. Report Polling Flag | Retransmission flag | 1 |
| NR-U Sequence Number | | | | | | | | | 3 |
| DL discard NR PDCP PDU SN | | | | | | | | | 0 or 3 |
| DL discard Number of blocks | | | | | | | | | 0 or 1 |
| DL discard NR PDCP PDU SN start (first block) | | | | | | | | | 0 or 3 |
| Discarded Block size (first block) | | | | | | | | | 0 or 1 |
| … | | | | | | | | |  |
| DL discard NR PDCP PDU SN start (last block) | | | | | | | | | 0 or 3 |
| Discarded Block size (last block) | | | | | | | | | 0 or 1 |
| DL report NR PDCP PDU SN | | | | | | | | | 0 or 3 |
| Number of Assistance Information Fields | | | | | | | | | 0 or 1 |
| Assistance Information Type | | | | | | | | | 0 or (2\*Number of Assistance Info Fields + sum of Number of octets for Radio Quality Assistance Information Fields +1) |
| Number of octets for Radio Quality Assistance Information Fields | | | | | | | | |
| Radio Quality Assistance Information | | | | | | | | |
| Logical Channel ID | | | | | | | | | 0 or 1 |
| UL PDCP Duplication Activation Flag | | | | | | | | | 0 or 1 |
| Padding | | | | | | | | | 0-3 |

Figure 5.5.2.1-1: DL USER DATA (PDU Type 0) Format

<Unchanged Text Omitted>

#### 5.5.2.3 ASSISTANCE INFORMATION DATA (PDU Type 2)

This frame format is defined to allow the node hosting the NR PDCP entity to receive assistance information.

The following shows the respective ASSISTANCE INFORMATION DATA frame.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | | | | Number of Octets |
| 7 | 6 | 5 | 4 | | 3 | | 2 | 1 | 0 |
| PDU Type (=2) | | | | PDCP Dupl. Ind. | | Assistance Info. Ind. | | UL Delay Ind. | DL Delay Ind. | 1 |
| Spare | | | | | | | UL PDCPDupl. Ind. | UL PDCP Dupl. assistance Info. Ind. | PDCP Duplication Activation Suggestion | 1 |
| Number of Assistance Information Fields | | | | | | | | | | 0 or 1 |
| Assistance Information Type | | | | | | | | | | 0 or (2\*Number of Assistance Info Fields + sum of Number of octets for Radio Quality Assistance Information Fields) |
| Number of octets for Radio Quality Assistance Information Fields | | | | | | | | | |
| Radio Quality Assistance Information | | | | | | | | | |
| UL Delay DU Result | | | | | | | | | | 0 or 4 |
| DL Delay DU Result | | | | | | | | | | 0 or 4 |
| Logical Channel ID | | | | | | | | | | 0 or 1 |
| UL PDCP Duplication Activation Flag | | | | | | | | | | 0 or 1 |

<Unchanged Text Omitted>

#### 5.5.3.Y UL PDCP Duplication Assistance Information Indicaton

**Description:** This field indicates the presence of the Number of Assistance Information Fields and the LCH ID.

**Value range:** {0= Number of Assistance Information Fields and Logical Channel ID not present, 1= Number of Assistance Information Fields and Logical Channel ID present}.

#### 5.5.3.Z Logical Channel ID

**Description:** This field indicates the logical channel for the corresponding RLC entity.

**Value range:** {1..25}..

**Field length:** 6 bit.

5.5.3.m UL PDCP Duplication Indication

**Description:** This field indicates the presence of the UL PDCP Duplication Activation Flag

**Value range:** {0= PDCP Duplication Activation Flag not present, 1= PDCP Duplication Activation Flag present}.

**Field length:** 1 bit.

5.5.3.n UL PDCP Duplication Activation Flag

**Description:** This parameter indicates that the node hosting the NR PDCP entity informs the corresponding node the UL duplication is activated or the corresponding node informs the node hosting the NR PDCP entity the UL duplication is activated for the RLC entity. This field indicates the activation/deactivation status of PDCP duplication for the RLC entity i where i is from bit 0 ascending order of logical channel ID of secondary RLC entities in the order of MCG and SCG, for the DRB. The RLCi field is set to 1 to indicate that the PDCP duplication for the RLC entity i has been activated. The RLCi field is set to 0 to indicate that the PDCP duplication for the RLC entity i has been deactivated

**Value range:** {000 - 111}.

**Field length:** 3 bits.

<Unchanged Text Omitted>

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| **Change Ends** |