**3GPP TSG-RAN3 Meeting #124 *R3-243793***

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.483** | **CR** | **0135** | **rev** | **1** | **Current version:** | **18.1.0** |  |
|  | | | | | | | | |
| *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:*** | Support of PDCP SN Gap Report | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Xiaomi, Huawei, Samsung, ZTE, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated, Ericsson, Lenovo, CATT | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_XR\_enh-Core | | | | |  | ***Date:*** | | | 2024-05-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)*  *Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Enhancements to Rel-18 discard (i.e., PDU Set discard and PSI-based discard) for XR services may increase the frequency and duration of gaps in the PDCP SN. This could lead to unnecessary delays, as the receiving PDCP entity depends on the PDCP reordering timer. To address this issue, RAN2 has agreed to introduce SN Gap Reporting from the PDCP transmitter to the PDCP receiver.  RAN2 agreed following:  **Agreements**  1. To define a mechanism for PDCP Transmitter to report to PDCP Receiver about the gap on the PDCP SN (i.e., transmitting PDCP entity can inform the receiving PDCP entity about the discarded SDUs).  2 To agree that the usage of a PDCP SN gap report is under network control (i.e. network configures UE whether/when PDCP SN gap report can be used). The UE should report only if there gaps (i.e. if the UE does re-association and there are not gaps, the UE is not required to transmit).  3 Define a new UE capability to indicate the support of PDCP SN Gap reporting.  According to these agreements, for UL, the UE is configured to send the PDCP SN gap report by gNB via RRC signalling. For DL, in case of split architecture, the gNB-CU-UP should be configured to send the PDCP SN Gap Report by gNB-CU-CP.  **Impact analysis**  Impact assessment towards the previous version of the specification (same release):  This CR has isolated impact with the previous version of the specification (same release).  This CR has impact on the functional point of view, the impact can be considered isolated because it only impacts the PDCP SN Gap Report. | | | | | | | | |
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| ***Summary of change:*** | | Add PDCP SN Gap Report IE in the PDCP Configuration IE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Sending PDCP SN Gap Report is not supported in gNB-CU-UP | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.3.1.38, 9.4.5, 9.4.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

<<<<<<<<<<<<<<<<<<<< First Change >>>>>>>>>>>>>>>>>>>>

9.3.1.38 PDCP Configuration

This IE carries the PDCP configuration.

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| PDCP SN UL Size | M |  | PDCP SN Size  9.3.1.61 | Indicates the PDCP SN UL size in bits. Corresponds to information provided in the *pdcp-SN-SizeUL* contained in the *PDCP-Config* IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.  Is ignored if received through *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message. | - |  |
| PDCP SN DL Size | M |  | PDCP SN Size  9.3.1.61 | Indicates the PDCP SN DL size in bits. Corresponds to information provided in the *pdcp-SN-SizeDL* contained in the *PDCP-Config* IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.  Is ignored if received through *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message. | - |  |
| RLC mode | M |  | ENUMERATED (RLC-TM, RLC-AM, RLC-UM-Bidirectional, RLC-UM-Unidirectional-UL, RLC-UM-Unidirectional-DL, …) | Indicates the RLC mode for the DRB. For more information see *PDCP-Config* IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.  Is ignored if received through *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message. | - |  |
| ROHC Parameters | O |  | 9.3.1.40 |  | - |  |
| T-Reordering Timer | O |  | 9.3.1.41 |  | - |  |
| Discard Timer | O |  | 9.3.1.42 | This IE is ignored if the *Discard Timer Extended* IE is present. | - |  |
| UL Data Split Threshold | O |  | 9.3.1.43 |  | - |  |
| PDCP Duplication | O |  | ENUMERATED (True, …) | Indicates whether PDCP duplication is to be configured for the DRB. This IE is ignored when the “*Additional PDCP duplication Information*” IE is present. | - |  |
| PDCP Re-establishment | O |  | ENUMERATED (true,…) | Indicates PDCP entity re-establishment to be triggered as defined in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation. | - |  |
| PDCP Data Recovery | O |  | ENUMERATED (true,…) | Indicates PDCP data recovery to be triggered as defined in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation. | - |  |
| Duplication Activation | O |  | ENUMERATED (  Active, Inactive, …) | Information on the initial state of DL PDCP duplication | - |  |
| Out Of Order Delivery | O |  | ENUMERATED (true,…) | Indicates whether or not outOfOrderDelivery specified in TS 38.323 [17] is configured. Out of order delivery is configured only when the radio bearer is established for gNB or ng-eNB CP-UP separation, or indicates whether or not rlc-OutOfOrderDelivery in TS 36.323 [34] is configured for eNB CP-UP separation. | - |  |
| PDCP Status Report Indication | O |  | ENUMERATED (downlink, uplink, both, …) | For AM DRB, “downlink” indicates that the PDCP entity is configured to send PDCP status report(s) to the UE, and “uplink” indicates that the UE is configured to send PDCP status report(s), as specified in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation. “both” indicates that both “downlink” and “uplink” should be applied. | YES | ignore |
| Additional PDCP duplication Information | O |  | ENUMERATED (three, four, …) | Indicates the number of PDCP duplication configured when it is more than 2 for the DRB | YES | ignore |
| EHC Parameters | O |  | 9.3.1.90 |  | YES | ignore |
| UDC Parameters | O |  | 9.3.1.104 |  | YES | ignore |
| Discard Timer Extended | O |  | 9.3.1.128 |  | YES | reject |
| PSI Based Discard Timer | O |  | 9.3.1.146 |  | YES | ignore |
| PDCP SN Gap Report | O |  | ENUMERATED (true, …) | Indicates whether the PDCP entity is configured to send a PDCP SN gap report in the downlink, as specified in TS 38.323 [7]. | YES | ignore |

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

9.4.5 Information Element Definitions

-- ASN1START

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-- Information Element Definitions

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

E1AP-IEs {

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

ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

id-CommonNetworkInstance,

id-SNSSAI,

id-OldQoSFlowMap-ULendmarkerexpected,

id-DRB-QoS,

id-endpoint-IP-Address-and-Port,

id-NetworkInstance,

id-QoSFlowMappingIndication,

id-TNLAssociationTransportLayerAddressgNBCUUP,

id-Cause,

id-QoSMonitoringRequest,

id-QosMonitoringReportingFrequency,

id-QoSMonitoringDisabled,

id-PDCP-StatusReportIndication,

id-RedundantCommonNetworkInstance,

id-redundant-nG-UL-UP-TNL-Information,

id-redundant-nG-DL-UP-TNL-Information,

id-RedundantQosFlowIndicator,

id-TSCTrafficCharacteristics,

id-ExtendedPacketDelayBudget,

id-CNPacketDelayBudgetDownlink,

id-CNPacketDelayBudgetUplink,

id-AdditionalPDCPduplicationInformation,

id-RedundantPDUSessionInformation,

id-RedundantPDUSessionInformation-used,

id-QoS-Mapping-Information,

id-MDTConfiguration,

id-TraceCollectionEntityURI,

id-EHC-Parameters,

id-DAPSRequestInfo,

id-EarlyForwardingCOUNTReq,

id-EarlyForwardingCOUNTInfo,

id-AlternativeQoSParaSetList,

id-MCG-OfferedGBRQoSFlowInfo,

id-Number-of-tunnels,

id-DataForwardingtoE-UTRANInformationList,

id-DataForwardingtoNG-RANQoSFlowInformationList,

id-MaxCIDEHCDL,

id-ignoreMappingRuleIndication,

id-EarlyDataForwardingIndicator,

id-QoSFlowsDRBRemapping,

id-SecurityIndicationModify,

id-DataForwardingSourceIPAddress,

id-M4ReportAmount,

id-M6ReportAmount,

id-M7ReportAmount,

id-PDUSession-PairID,

id-SurvivalTime,

id-UDC-Parameters,

id-SecurityIndication,

id-SecurityResult,

id-SDTindicatorSetup,

id-SDTindicatorMod,

id-DiscardTimerExtended,

id-MCForwardingResourceRequest,

id-MCForwardingResourceIndication,

id-MCForwardingResourceResponse,

id-MCForwardingResourceRelease,

id-MCForwardingResourceReleaseIndication,

id-PDCP-COUNT-Reset,

id-MBSSessionAssociatedInfoNonSupportToSupport,

id-VersionID,

id-MBSAreaSessionID,

id-Secondary-PDU-Session-Data-Forwarding-Information,

id-MBSSessionResourceNotification,

id-MCBearerContextInactivityTimer,

id-MCBearerContextStatusChange,

id-SpecialTriggeringPurpose,

id-F1UTunnelNotEstablished,

id-PDUSetQoSParameters,

id-N6JitterInformation,

id-ECNMarkingorCongestionInformationReportingRequest,

id-ECNMarkingorCongestionInformationReportingStatus,

id-PDUSetbasedHandlingIndicator,

id-IndirectPathIndication,

id-F1U-TNL-InfoToAdd-List,

id-F1U-TNL-InfoAdded-List,

id-F1U-TNL-InfoToAddOrModify-List,

id-F1U-TNL-InfoAddedOrModified-List,

id-F1U-TNL-InfoToRelease-List,

id-BroadcastF1U-ContextReferenceE1,

id-PSIbasedDiscardTimer,

id-PDCPSNGapReport,

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

PDCP-Configuration-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

{ID id-PDCP-StatusReportIndication CRITICALITY ignore EXTENSION PDCP-StatusReportIndication PRESENCE optional}|

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

{ ID id-EHC-Parameters CRITICALITY ignore EXTENSION EHC-Parameters PRESENCE optional}|

{ ID id-UDC-Parameters CRITICALITY ignore EXTENSION UDC-Parameters PRESENCE optional}|

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

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

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

...

}

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

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

### 9.4.7 Constant Definitions

-- ASN1START

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

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-- Constant definitions

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

<<<<<<<<<<<<<<<<<<<< omit the unchanged parts >>>>>>>>>>>>>>>>>>>>

id-F1U-TNL-InfoToRelease-List ProtocolIE-ID ::= 212

id-BroadcastF1U-ContextReferenceE1 ProtocolIE-ID ::= 213

id-PSIbasedDiscardTimer ProtocolIE-ID ::= 214

id-PDCPSNGapReport ProtocolIE-ID ::= xxx

<<<<<<<<<<<<<<<<<<<< End of Change >>>>>>>>>>>>>>>>>>>>