**3GPP TSG-RAN2 Meeting #109e *R2-200xxxx***

**Electronic meeting, 24th February – 6th March, 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.331** | **CR** | **4228** | **rev** | **1** | **Current version:** | **15.8.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Introduction of NR IIoT | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IIOT | | | | |  | ***Date:*** | | | 2020-03-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Ethernet header compression features specified in the Work Item on support of Industrial Internet of Things (NR\_IIOT). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This CR introduces Ethernet header compression features specified in NR\_IIOT WI. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | If the CR is not approved, the features introduced in NR IIoT are not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 36.323 CR 0278 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*START OF CHANGES*

# 6 Protocol data units, formats and parameters (tabular & ASN.1)

## 6.3 RRC information elements

### 6.3.2 Radio resource control information

#### – *PDCP-Config*

The IE *PDCP-Config* is used to set the configurable PDCP parameters for data radio bearers.

*PDCP-Config* information element

-- ASN1START

PDCP-Config ::= SEQUENCE {

discardTimer ENUMERATED {

ms50, ms100, ms150, ms300, ms500,

ms750, ms1500, infinity

} OPTIONAL, -- Cond Setup

rlc-AM SEQUENCE {

statusReportRequired BOOLEAN

} OPTIONAL, -- Cond Rlc-AM

rlc-UM SEQUENCE {

pdcp-SN-Size ENUMERATED {len7bits, len12bits}

} OPTIONAL, -- Cond Rlc-UM

headerCompression CHOICE {

notUsed NULL,

rohc SEQUENCE {

maxCID INTEGER (1..16383) DEFAULT 15,

profiles SEQUENCE {

profile0x0001 BOOLEAN,

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0101 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

...

}

},

...,

[[ rn-IntegrityProtection-r10 ENUMERATED {enabled} OPTIONAL -- Cond RN

]],

[[ pdcp-SN-Size-v1130 ENUMERATED {len15bits} OPTIONAL -- Cond Rlc-AM2

]],

[[ ul-DataSplitDRB-ViaSCG-r12 BOOLEAN OPTIONAL, -- Need ON

t-Reordering-r12 ENUMERATED {

ms0, ms20, ms40, ms60, ms80, ms100, ms120, ms140,

ms160, ms180, ms200, ms220, ms240, ms260, ms280, ms300,

ms500, ms750, spare14, spare13, spare12, spare11, spare10,

spare9, spare8, spare7, spare6, spare5, spare4, spare3,

spare2, spare1} OPTIONAL -- Cond SetupS

]],

[[ ul-DataSplitThreshold-r13 CHOICE {

release NULL,

setup ENUMERATED {

b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800,

b25600, b51200, b102400, b204800, b409600, b819200,

spare1}

} OPTIONAL, -- Need ON

pdcp-SN-Size-v1310 ENUMERATED {len18bits} OPTIONAL, -- Cond Rlc-AM3

statusFeedback-r13 CHOICE {

release NULL,

setup SEQUENCE {

statusPDU-TypeForPolling-r13 ENUMERATED {type1, type2} OPTIONAL, -- Need ON

statusPDU-Periodicity-Type1-r13 ENUMERATED {

ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90,

ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000,

ms10000, ms20000, ms50000} OPTIONAL, -- Need ON

statusPDU-Periodicity-Type2-r13 ENUMERATED {

ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90,

ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000,

ms10000, ms20000, ms50000} OPTIONAL, -- Need ON

statusPDU-Periodicity-Offset-r13 ENUMERATED {

ms1, ms2, ms5, ms10, ms25, ms50, ms100, ms250, ms500,

ms2500, ms5000, ms25000} OPTIONAL -- Need ON

}

} OPTIONAL -- Need ON

]],

[[ ul-LWA-Config-r14 CHOICE {

release NULL,

setup SEQUENCE {

ul-LWA-DRB-ViaWLAN-r14 BOOLEAN,

ul-LWA-DataSplitThreshold-r14 ENUMERATED {

b0, b100, b200, b400, b800, b1600, b3200, b6400,

b12800, b25600, b51200, b102400, b204800, b409600,

b819200 } OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

uplinkOnlyHeaderCompression-r14 CHOICE {

notUsed-r14 NULL,

rohc-r14 SEQUENCE {

maxCID-r14 INTEGER (1..16383) DEFAULT 15,

profiles-r14 SEQUENCE {

profile0x0006-r14 BOOLEAN

},

...

}

} OPTIONAL -- Need ON

]],

[[ uplinkDataCompression-r15 SEQUENCE {

bufferSize-r15 ENUMERATED {kbyte2, kbyte4, kbyte8, spare1},

dictionary-r15 ENUMERATED {sip-SDP, operator} OPTIONAL, -- Need OR

...

} OPTIONAL,-- Cond Rlc-AM4

pdcp-DuplicationConfig-r15 CHOICE {

release NULL,

setup SEQUENCE {

pdcp-Duplication-r15 ENUMERATED {configured, activated}

}

} OPTIONAL -- Need ON

]],

[[

ethernetHeaderCompression-r16 CHOICE {

notUsed NULL,

ehc SEQUENCE {

ehc-Common SEQUENCE {

ehc-HeaderSize ENUMERATED { byte1, byte2 },

...

},

ehc-Downlink SEQUENCE {

drb-ContinueEHC-DL ENUMERATED { true } OPTIONAL, -- Need N

...

} OPTIONAL, -- Need N

ehc-Uplink SEQUENCE {

drb-ContinueEHC-UL ENUMERATED { true } OPTIONAL, -- Need N

...

} OPTIONAL, -- Need N

...

},

...

} OPTIONAL -- Cond DRB

]]

}

-- ASN1STOP

| *PDCP-Config* field descriptions |
| --- |
| ***bufferSize***  Indicates the buffer size applied for UDC specified in TS 36.323 [8]. Value *kbyte2* means 2048 bytes, *kbyte4* means 4096 bytes and so on. E-UTRAN does not reconfigure *bufferSize* for a DRB except for handover cases. |
| ***dictionary***  Indicates which pre-defined dictionary is used for UDC as specified in TS 36.323 [8]. The value *sip-SDP* means that UE shall prefill the buffer with standard dictionary for SIP and SDP defined in TS 36.323 [8], and the value *operator* means that UE shall prefill the buffer with operator-defined dictionary. |
| ***discardTimer***  Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms50 means 50 ms, ms100 means 100 ms and so on. |
| ***drb-ContinueEHC-DL, drb-ContinueEHC-UL***  The fields indicate whether the PDCP entity continues or resets the EHC header compression protocol during PDCP re-establishment, as specified in TS 38.323 [5]. The field *drb-ContinueEHC-DL* indicates whether the PDCP entity continues or resets for downlink and the field *drb-ContinueEHC-UL* indicates whether the PDCP entity continues or resets for uplink. These fields are configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |
| ***ehc-HeaderSize***  Indicates the size of the header for EHC packet.  Editor’s note: The field is to capture the agreement ”Both 1-byte header and 2-bytes header is supported and the choice depends on RRC configuration (of DRB). For one DRB the header size is fixed.” This does not include the size of the Ethernet header, and the name will be updated. The name and the description will also be aligned with PDCP specification. FFS: The relation with the length of the CID field. |
| ***ethernetHeaderCompression***  If *ehc-Downlink* is configured, then Ethernet header compression is configured for downlink. Otherwise, it is not configured for downlink.  If *ehc-Uplink* is configured, then Ethernet header compression is configured for uplink. Otherwise, it is not configued for uplink.  The fields in *ehc-Common* applies for both donwlink and uplink once configured. Ethernet Header compression can only be configured for DRB. |
| ***headerCompression***  E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. For split and LWA DRBs E-UTRAN configures only *notUsed.* E-UTRAN only configures this field when neither *uplinkOnlyHeaderCompression* nor *uplinkDataCompression* is configured.  If *headerCompression* is configured, the UE shall apply the configured ROHC profile(s) in both uplink and downlink. ROHC and EHC can be both configured simultaneously for a DRB. |
| ***maxCID***  Indicates the value of the MAX\_CID parameter as specified in TS 36.323 [8]. The total value of MAX\_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE. |
| ***pdcp-Duplication***  Parameter for configuring PDCP duplication as specified in TS 36.323 [8]. Value *configured* indicates that PDCP duplication is configured but initially deactivated and value *activated* indicates that PDCP duplication is configured and activated upon configuration. For EN-DC, E-UTRAN configures PDCP duplication for MCG DRB only if PDCP duplication is not configured for any split DRB. |
| ***pdcp-SN-Size***  Indicates the PDCP Sequence Number length in bits. For RLC UM: value *len7bits* means that the 7-bit PDCP SN format is used and *len12bits* means that the 12-bit PDCP SN format is used. For RLC AM: value *len15bits* means that the 15-bit PDCP SN format is used, value *len18bits* means that the 18-bit PDCP SN format is used, otherwise if the field is not included upon setup of the PCDP entity 12-bit PDCP SN format is used, as specified in TS 36.323 [8]. |
| ***profiles***  The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB's is signalled, only the profile corresponding to the highest value shall be applied. E-UTRAN does not configure ROHC while *t-Reordering* is configured (i.e. for split DRBs, for LWA bearers or upon reconfiguration from split or LWA to MCG DRB). |
| ***statusFeedback***  Indicates whether the UE shall send PDCP Status Report periodically or by E-UTRAN polling as specified in TS 36.323 [8]. E-UTRAN configures this field only for LWA DRB. |
| ***statusPDU-TypeForPolling***  Indicates the PDCP Control PDU option when it is triggered by E-UTRAN polling. Value *type1* indicates using the legacy PDCP Control PDU for PDCP status reporting and value *type2* indicates using the LWA specific PDCP Control PDU for LWA status reporting as specified in TS 36.323 [8]. |
| ***statusPDU-Periodicity-Type1***  Indicates the value of the PDCP Status reporting periodicity for *type1* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on. |
| ***statusPDU-Periodicity-Type2***  Indicates the value of the PDCP Status reporting periodicity for *type2* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on. |
| ***statusPDU-Periodicity-Offset***  Indicates the value of the offset for *type2* Status PDU periodicity, as specified in TS 36.323 [8]. Value in milliseconds. Value ms1 means 1 ms, ms2 means 2 ms and so on. |
| ***t-Reordering***  Indicates the value of the reordering timer, as specified in TS 36.323 [8]. Value in milliseconds. Value ms0 means 0 ms and behaviour as specified in 7.3.2 applies, ms20 means 20 ms and so on. |
| ***rn-IntegrityProtection***  Indicates that integrity protection or verification shall be applied for all subsequent packets received and sent by the RN on the DRB. |
| ***statusReportRequired***  Indicates whether or not the UE shall send a PDCP Status Report upon re-establishment of the PDCP entity and upon PDCP data recovery as specified in TS 36.323 [8]. |
| ***ul-DataSplitDRB-ViaSCG***  Indicates whether the UE shall send PDCP PDUs via SCG as specified in TS 36.323 [8]. E-UTRAN only configures the field (i.e. indicates value *TRUE*) for split DRBs. For PDCP duplication, if this field is set to *TRUE*, the primary RLC entity is SCG RLC entity and the secondary RLC entity is MCG RLC entity. If this field is not configured or set to *FALSE*, the primary RLC entity is MCG RLC entity and the secondary RLC entity is SCG RLC entity. |
| ***ul-DataSplitThreshold***  Indicates the threshold value for uplink data split operation specified in TS 36.323 [8]. Value b100 means 100 Bytes, b200 means 200 Bytes and so on. E-UTRAN only configures this field for split DRBs. |
| ***ul-LWA-DRB-ViaWLAN***  Indicates whether the UE shall send PDCP PDUs via the LWAAP entity as specified in TS 36.323 [8]. E‑UTRAN only configures this field (i.e. indicates value *TRUE*) for LWA DRBs. |
| ***ul-LWA-DataSplitThreshold***  Indicates the threshold value for uplink data split operation as specified in TS 36.323 [8]. Value b0 means 0 Bytes, b100 means 100 Bytes and so on. E-UTRAN only configures this field for LWA DRBs. |
| ***uplinkDataCompression***  Indicates the UDCconfiguration that the UE shall apply**.** E-UTRAN does not configure *uplinkDataCompression* for a DRB, if *headerCompression* or *uplinkOnlyHeaderCompression* is already configured for the DRB. E-UTRAN does not configure *uplinkDataCompression* for the split and LWA DRBs*.*The maximum number of DRBs where *uplinkDataCompression* can be applied is two. In this version of the specification, for existing DRBs, E-UTRAN can only configure *uplinkDataCompression* via handover procedure. |
| ***uplinkOnlyHeaderCompression***  Indicates the ROHC configuration that the UE shall apply uplink-only ROHC operations, see TS 36.323 [8]. E-UTRAN only configures this field when *headerCompression* is not configured.  E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. For split and LWA DRBs E-UTRAN configures only *notUsed*. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *DRB* | This field is mandatory present when the corresponding DRB is being set up, absent for SRBs. Otherwise this field is optionally present, need M. |
| *Rlc-AM* | The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need ON, in case of reconfiguration of a PDCP entity at handover, at the first reconfiguration after RRC re-establishment or at SCG change involving PDCP re-establishment or PDCP data recovery for a radio bearer configured with RLC AM. Otherwise the field is not present. |
| *Rlc-AM2* | The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM. Otherwise the field is not present. |
| *Rlc-AM3* | The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM, if *pdcp-SN-Size-v1130* is absent. Otherwise the field is not present. |
| *Rlc-AM4* | The field is optionally present, need ON, upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need OP, in case of reconfiguration of a PDCP entity at handover. Otherwise the field is not present and the UE shall continue to use the existing value. |
| *Rlc-UM* | The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC UM. It is optionally present, Need ON, upon handover within E-UTRA, upon the first reconfiguration after re-establishment and upon SCG change involving PDCP re-establishment. Otherwise the field is not present. |
| *RN* | The field is optionally present when signalled to the RN, need OR. Otherwise the field is not present. |
| *Setup* | The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON. |
| *SetupS* | The field is mandatory present in case of setup of or reconfiguration to a split DRB or LWA DRB. The field is optionally present upon reconfiguration of a split DRB or LWA DRB or upon DRB type change from split to MCG DRB or from LWA to LTE only, need ON. Otherwise the field is not present. |