**3GPP TSG RAN Meeting #93e *RP-21xxxx***

**Electronic meeting, 13 – 17 September, 2021**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.822** | **CR** | XXXX | **rev** | **-** | **Current version:** | **16.0.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of informative annex on list of Rel-15 features relevant to URLLC |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | Nokia, Nokia Shanghai Bell |
|  |  |
| ***Work item code:*** | NR\_NewRAT-Core |  | ***Date:*** | 2021-09-15 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 canbe 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-15 NR, all UE features are defined together without a clear distinction between those related to different services. In particular it is not immediately clear which features are relevant to UEs supporting ultra-reliable and/or low latency services. This causes confusion when determining what "URLLC" means in practice since the NR URLLC features are grouped differently in Rel-16. |
|  |  |
| ***Summary of change:*** | 1. Introduce a new informative annex to 38.822 that lists the Rel-15 UE capabilities that are relevant to UEs supporting ultra-reliable and/or low latency services.

**Impact analysis**Impacted functionality: no functionalities are impacted by this CR.Inter-operability: no inter-operability issues due to this CR. |
|  |  |
| ***Consequences if not approved:*** | It remains unclear which Rel-15 features are relevant for URLLC services. |
|  |  |
| ***Clauses affected:*** | 2, Annex X (new) |
|  |  |
|  | **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 Modified Subclause*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[3] 3GPP R1-1907862: "RAN1 NR UE features", contribution to TSG-RAN WG1 meeting #XX.

[4] 3GPP R2-1906665: "Update of L2/3 feature lists", contribution to TSG-RAN WG2 meeting #105bis.

[5] 3GPP R4-1907593: "RAN4 NR UE features", contribution to TSG-RAN WG4 meeting #XX.

[6] 3GPP R1-2106160: "Updated RAN1 UE features list for Rel-16 NR after RAN1#105-e", contribution to TSG-RAN WG1 meeting #105-e.

[7] 3GPP R2-2100378:"RAN2 UE features list for Rel-16 NR", contribution to TSG-RAN WG2 meeting #113e.

[8] 3GPP R4-2108334:"Updated RAN4 UE features list for Rel-16", contribution to TSG-RAN WG4 meeting #99-e.

[9] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[10] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[11] 3GPP TS 38.340: "NR; Backhaul Adaptation Protocol (BAP) specification".

[12] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[13] 3GPP TS 37.324: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Service Data Adaptation Protocol (SDAP) specification".

[14] 3GPP TS 36.306: "UE Radio Access capabilities".

[15] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

[x] 3GPP TR 38.300: "NR; NR and NG-RAN Overall description; Stage-2".

*Next Modified Subclause*

Annex X (informative): URLLC capabilities

The Release 15 features listed in Table X-1 are some of the features for UEs supporting services requiring ultra reliability and/or low latency, as defined in [x]. It should be noted that the list is not exhaustive and not all features need to be supported at the same time for UEs supporting services requiring ultra reliability and/or low latency.

Table X-1: Rel-15 UE capabilities relevant for UEs supporting ultra-reliable and/or low latency services

| Feature Category | 3GPP capabilities |
| --- | --- |
| Repetitions | *pusch-RepetitionMultiSlots* |
|  | *pdsch-RepetitionMultiSlots* |
|  | *type1-PUSCH-RepetitionMultiSlots* |
|  | *type2-PUSCH-RepetitionMultiSlots* |
| Mini-slot | *pdsch-MappingTypeA* |
|  | *pdsch-MappingTypeB* |
|  | *~~rateMatchingResrcSetSemi-Static~~* |
|  | *~~rateMatchingResrcSetDynamic~~* |
|  | *pdsch-ProcessingType1-DifferentTB-PerSlot* |
|  | *pusch-ProcessingType1-DifferentTB-PerSlot* |
| PDCCH processing | *pdcch-MonitoringAnyOccasionsWithSpanGap* |
|  | *pdcch-MonitoringAnyOccasions* |
|  | *pdcch-MonitoringSingleOccasion* |
| UL configured grant | *configuredUL-GrantType1* |
|  | *configuredUL-GrantType2* |
|  | *~~skipUplinkTxDynamic~~* |
| DL SPS | *downlinkSPS* |
| HARQ-ACK | *mux-HARQ-ACK-PUSCH-DiffSymbol* |
| Reduced processing time | *pdsch-ProcessingType2* |
|  | *pusch-ProcessingType2* |
| Ultra-reliable CQI/MCS | *cqi-TableAlt* |
|  | *dl-64QAM-MCS-TableAlt* |
|  | *ul-64QAM-MCS-TableAlt* |
|  | *dl-MCS-TableAlt-DynamicIndication* |
|  | *ul-MCS-TableAlt-DynamicIndication* |
| PDCP duplication | *pdcp-DuplicationSplitSRB* |
|  | *pdcp-DuplicationSRB* |
|  | *pdcp-DuplicationMCG-OrSCG-DRB* |
|  | *pdcp-DuplicationSplitDRB* |
|  | *~~PDCP-ParametersMRDC~~* |
|  | *~~PDCP-Parameters~~* |

*End of Changes*