**3GPP TSG-RAN WG2 Meeting #119-eR2-22xxxxx**

**Online, 19 – 20 August, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** |  **3394** | **rev** | **1** | **Current version:** | **16.9.0** |  |
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| *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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Correction of PUSCH repetition configuration |
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| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_IIOT-Core |  | ***Date:*** | 2022-08-10 |
|  |  |  |  |  |
| ***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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | There is an issue in the configuration of Rel-16 PUSCH TDRA. The IEs *mappingtype-r16* and *startSymbolAndLength-r16* are both optional where the associated condition *NotFormat01-02-Or-TypeA* states that these IEs are “optionally present if *pusch-RepTypeIndicatorDCI-0-1* is set to pusch-RepTypeA, Need R”. However, it is not clear what the UE should assume for these parameters if they are not configured for Type A repetition.  |
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| ***Summary of change:*** | Make the configuration of *mappingtype-r16* and *startSymbolAndLength-r16* mandatory for PUSCH repetition type A by updating the condition *NotFormat01-02-Or-TypeA***Impact Analysis:**Impacted 5G architecture options: (NG)EN-DC, NE-DC, NR-SA, NR-DCImpacted functionality:URLLCInteroperability issue:* If the Network is implemented according to the CR and the UE is not, there is no inter-operability issue.
* If the UE is implemented according to the CR and the Network is not, the Network may not configure the PUSCH repetition parameters correctly.
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| ***Consequences if not approved:*** | There may be mis-configuration of PUSCH repetition parameters. |
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| ***Clauses affected:*** | 6.3.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*Start of Changes*

### 6.3.2 Radio resource control information elements

#### *<<Skipped unchanged parts>>*

#### – *PUSCH-TimeDomainResourceAllocationList*

The IE *PUSCH-TimeDomainResourceAllocation* is used to configure a time domain relation between PDCCH and PUSCH. *PUSCH-TimeDomainResourceAllocationList* contains one or more of such *PUSCH-TimeDomainResourceAllocations*. The network indicates in the UL grant which of the configured time domain allocations the UE shall apply for that UL grant. The UE determines the bit width of the DCI field based on the number of entries in the *PUSCH-TimeDomainResourceAllocationList*. Value 0 in the DCI field refers to the first element in this list, value 1 in the DCI field refers to the second element in this list, and so on.

*PUSCH-TimeDomainResourceAllocation* information element

-- ASN1START

-- TAG-PUSCH-TIMEDOMAINRESOURCEALLOCATIONLIST-START

PUSCH-TimeDomainResourceAllocationList ::= SEQUENCE (SIZE(1..maxNrofUL-Allocations)) OF PUSCH-TimeDomainResourceAllocation

PUSCH-TimeDomainResourceAllocation ::= SEQUENCE {

 k2 INTEGER(0..32) OPTIONAL, -- Need S

 mappingType ENUMERATED {typeA, typeB},

 startSymbolAndLength INTEGER (0..127)

}

PUSCH-TimeDomainResourceAllocationList-r16 ::= SEQUENCE (SIZE(1..maxNrofUL-Allocations-r16)) OF PUSCH-TimeDomainResourceAllocation-r16

PUSCH-TimeDomainResourceAllocation-r16 ::= SEQUENCE {

 k2-r16 INTEGER(0..32) OPTIONAL, -- Need S

 puschAllocationList-r16 SEQUENCE (SIZE(1..maxNrofMultiplePUSCHs-r16)) OF PUSCH-Allocation-r16,

...

}

PUSCH-Allocation-r16 ::= SEQUENCE {

 mappingType-r16 ENUMERATED {typeA, typeB} OPTIONAL, -- Cond NotFormat01-02-Or-TypeA

 startSymbolAndLength-r16 INTEGER (0..127) OPTIONAL, -- Cond NotFormat01-02-Or-TypeA

 startSymbol-r16 INTEGER (0..13) OPTIONAL, -- Cond RepTypeB

 length-r16 INTEGER (1..14) OPTIONAL, -- Cond RepTypeB

 numberOfRepetitions-r16 ENUMERATED {n1, n2, n3, n4, n7, n8, n12, n16} OPTIONAL, -- Cond Format01-02

 ...

}

-- TAG-PUSCH-TIMEDOMAINRESOURCEALLOCATIONLIST-STOP

-- ASN1STOP

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| *PUSCH-TimeDomainResourceAllocationList* field descriptions |
| ***k2***Corresponds to L1 parameter 'K2' (see TS 38.214 [19], clause 6.1.2.1) When the field is absent the UE applies the value 1 when PUSCH SCS is 15/30 kHz; the value 2 when PUSCH SCS is 60 kHz, and the value 3 when PUSCH SCS is 120KHz. |
| ***length***Indicates the length allocated for PUSCH for DCI format 0\_1/0\_2 (see TS 38.214 [19], clause 6.1.2.1). |
| ***mappingType***Mapping type (see TS 38.214 [19], clause 6.1.2.1). |
| ***numberOfRepetitions***Number of repetitions for DCI format 0\_1/0\_2 (see TS 38.214 [19], clause 6.1.2.1). |
| ***puschAllocationList***One or multiple PUSCH continuous in time domain which share a common *k2* (see TS 38.214 [19], clause 6.1.2.1). This list only has one element in *pusch-TimeDomainAllocationListDCI-0-1-r16* and in *pusch-TimeDomainAllocationListDCI-0-2-r16*. |
| ***startSymbol***Indicates the index of start symbol for PUSCH for DCI format 0\_1/0\_2 (see TS 38.214 [19], clause 6.1.2.1). |
| ***startSymbolAndLength***An index giving valid combinations of start symbol and length (jointly encoded) as start and length indicator (SLIV). The network configures the field so that the allocation does not cross the slot boundary. (see TS 38.214 [19], clause 6.1.2.1). |

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| **Conditional Presence** | **Explanation** |
| *Format01-02* | In *pusch-TimeDomainAllocationListForMultiPUSCH-r16*, the field is absent.In *pusch-TimeDomainAllocationListDCI-0-1* and in *pusch-TimeDomainAllocationListDCI-0-2*,the field is mandatory present. |
| *NotFormat01-02-Or-TypeA* | In *pusch-TimeDomainAllocationListForMultiPUSCH-r16*, the field is mandatory present.In *pusch-TimeDomainAllocationListDCI-0-1,* the field is mandatory present if *pusch-RepTypeIndicatorDCI-0-1* is set to pusch-RepTypeA. It is absent otherwise, Need R.In *pusch-TimeDomainAllocationListDCI-0-2,* the field is mandatory present if *pusch-RepTypeIndicatorDCI-0-2* is set to pusch-RepTypeA. It is absent otherwise, Need R. |
| *RepTypeB* | In *pusch-TimeDomainAllocationListForMultiPUSCH-r16*, the field is absent.In *pusch-TimeDomainAllocationListDCI-0-1,* the field is optionally present if *pusch-RepTypeIndicatorDCI-0-1* is set to pusch-RepTypeB, Need R. It is absent otherwise, Need R.In *pusch-TimeDomainAllocationListDCI-0-2,* the field is optionally present if *pusch-RepTypeIndicatorDCI-0-2* is set to pusch-RepTypeB, Need R. It is absent otherwise, Need R. |

*End of Changes*