**3GPP TSG-****RAN2 Meeting #109bis electronic R2-2004136**

**20th – 30th April, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **1568** | **rev** | **1** | **Current version:** | **16.0.0** |  |
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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 on PUCCH configuration |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | RAN2 |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-04-20 |
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| ***Category:*** | **A** |  | ***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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| Reason for change: | RAN2 sent an LS to RAN1 in R2-1916481 to ask about PUCCH configuration for NR standalone and late drop architectures, and RAN1 replied the LS in R1-2001306 with the following clarification:*The restriction for PUCCH configuration for EN-DC in the LS is also applied to NGEN-DC and NE-DC.**For NR-CA (without configured SCG), the restriction in the LS is not applied. The maximum number of PUCCH groups is two, i.e. only primary PUCCH group and secondary PUCCH group are allowed at most.**For NR-DC, the maximum number of PUCCH groups in each CG is one. Only the same numerology is supported for the CG with carriers only in FR2.*Note that for NR standalone (i.e. NR-CA above), there is already a clarification, “If supported by the UE, the network may configure at most one additional SCell of a cell group with *PUCCH-Config* (i.e. PUCCH SCell)” in the specification. |
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| ***Summary of change:*** | Capture the PUCCH configuration restriction as indicated in R1-2001306 for NGEN-DC, NE-DC and NR-DC.**Impact Analysis**Impacted 5G architecture options: NE-DC, NR-DC, NGEN-DCImpacted functionality:PUCCH configuration Inter-operability:1. If the network is implemented according to the CR and the UE is not, there is no inter-operability problem, since the network would configure PUCCH according to the restriction and this restriction would not affect the UE.2. If the UE is implemented according to the CR and the network is not, there is an inter-operability problem, since the UE assumes the network shall configure PUCCH according to this restriction but the network may configure PUCCH not following the restriction. |
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| ***Consequences if not approved:*** | The network and the UE may have different understanding on the PUCCH configuration, and the UE may consider a PUCCH configuration invalid and report reconfiguration failure. |
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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:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

---------------------------------------------START OF CHANGE-------------------------------------------

– *BWP-UplinkDedicated*

The IE *BWP-UplinkDedicated* is used to configure the dedicated (UE specific) parameters of an uplink BWP.

***BWP-UplinkDedicated* information element**

-- ASN1START

-- TAG-BWP-UPLINKDEDICATED-START

BWP-UplinkDedicated ::= SEQUENCE {

 pucch-Config SetupRelease { PUCCH-Config } OPTIONAL, -- Need M

 pusch-Config SetupRelease { PUSCH-Config } OPTIONAL, -- Need M

 configuredGrantConfig SetupRelease { ConfiguredGrantConfig } OPTIONAL, -- Need M

 srs-Config SetupRelease { SRS-Config } OPTIONAL, -- Need M

 beamFailureRecoveryConfig SetupRelease { BeamFailureRecoveryConfig } OPTIONAL, -- Cond SpCellOnly

 ...,

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 cp-ExtensionC2-r16 INTEGER (1..28) OPTIONAL, -- Need R

 cp-ExtensionC3-r16 INTEGER (1..28) OPTIONAL, -- Need R

 useInterlacePUCCH-PUSCH-r16 ENUMERATED {enabled} OPTIONAL, -- Need M

 pucch-ConfigurationList-r16 SetupRelease { PUCCH-ConfigurationList-r16 } OPTIONAL, -- Need M

 configuredGrantConfigList-r16 SetupRelease { ConfiguredGrantConfigList-r16 } OPTIONAL -- Need M

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}

-- TAG-BWP-UPLINKDEDICATED-STOP

-- ASN1STOP

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| ***BWP-UplinkDedicated* field descriptions** |
| ***beamFailureRecoveryConfig***Configuration of beam failure recovery. If *supplementaryUplink* is present, the field is present only in one of the uplink carriers, either UL or SUL. |
| ***configuredGrantConfig***A *Configured-Grant* of *type1* or *type2*. It may be configured for UL or SUL but in case of *type1* not for both at a time. Except for reconfiguration with sync, the NW does not reconfigure *configuredGrantConfig* when there is an active configured uplink grant Type 2 (see TS 38.321 [3]). However, the NW may release the *configuredGrantConfig* at any time. |
| ***configuredGrantConfigList***A list of multiple configured grant configurations for one BWP. Except for reconfiguration with sync, the NW does not reconfigure a Type 2 configured grant configuration when it is active (see TS 38.321 [3]). However, the NW may release a configured grant configuration at any time. |
| ***cp-ExtensionC2, cp-ExtensionC3***Configures the cyclic prefix (CP) extension (see TS 38.211 [16], clause 5.3.1). For 15 and 30 kHz SCS, {1..28} are valid. For 60 kHz SCS, {2..28} are valid. |
| ***pucch-Config***PUCCH configuration for one BWP of the normal UL or SUL of a serving cell. If the UE is configured with SUL, the network configures PUCCH only on the BWPs of one of the uplinks (normal UL or SUL). The network configures *PUCCH-Config* at least on non-initial BWP(s) for SpCell and PUCCH SCell. If supported by the UE, the network may configure at most one additional SCell of a cell group with *PUCCH-Config* (i.e. PUCCH SCell).In (NG)EN-DC and NE-DC, the NW configures at most one serving cell per frequency range with PUCCH. In (NG)EN-DC and NE-DC, if two PUCCH groups are configured, the serving cells of the NR PUCCH group in FR2 use the same numerology. For NR-DC, the maximum number of PUCCH groups in each cell group is one, and only the same numerology is supported for the cell group with carriers only in FR2.The NW may configure PUCCH for a BWP when setting up the BWP. The network may also add/remove the *pucch-Config* in an *RRCReconfiguration* with *reconfigurationWithSync* (for SpCell or PUCCH SCell) or with SCell release and add (for PUCCH SCell) to move the PUCCH between the UL and SUL carrier of one serving cell. In other cases, only modifications of a previously configured *pucch-Config* are allowed.If one (S)UL BWP of a serving cell is configured with PUCCH, all other (S)UL BWPs must be configured with PUCCH, too. |
| ***pucch-ConfigurationList***PUCCH configurations for two simultaneously constructed HARQ-ACK codebooks (see TS 38.213 [13], clause 9.1).Editor's note: From RAN1 Rapporteur Note: We don't have agreement on whether to do separate configuration for schedulingRequestResourceToAddModList and multi-CSI-PUCCH-ResourceList yet. However, we agreed to do separate configuration for all the remaining RRC parameter. From RRC parameter implementation perspective, it seems easier to introduce separate PUCCH-Confi for different HARQ-ACK codebooks. If there is no need to do separate configuration for schedulingRequestResourceToAddModList and multi-CSI-PUCCH-ResourceList, the corrsponding configuration can not include these two optional parameters and then in RAN1 spec can indicate that SR PUCCH resource and multi-CSI PUCCH resource can just follow the configuration in one of the PUCCH configurations. Editor's note: It is not clear about how to use the *pucch-ConfigurationList* for PUCCH resources for SR and CSI in RAN2 understandings, for example, whether to use a PUCCH Config ID to indicate the corresponding *pucch-Config* in the *pucch-ConfigurationList* for a PUCCH resource. More RAN1 inputs are needed. |
| ***pusch-Config***PUSCH configuration for one BWP of the normal UL or SUL of a serving cell. If the UE is configured with SUL and if it has a *PUSCH-Config* for both UL and SUL, an UL/SUL indicator field in DCI indicates which of the two to use. See TS 38.212 [17], clause 7.3.1. |
| ***srs-Config***Uplink sounding reference signal configuration. |
| ***useInterlacePUCCH-PUSCH***If the field is present, the UE uses uplink frequency domain resource allocation Type 2 for PUSCH (see 38.213 clause 8.3 and 38.214 clause 6.1.2.2) and uses interlaced PUCCH Format 0, 1, 2, and 3 for PUCCH (see TS 38.213 [13], clause 9.2.1). |

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| **Conditional Presence** | **Explanation** |
| *SpCellOnly* | The field is optionally present, Need M, in the *BWP-UplinkDedicated* of an SpCell. It is absent otherwise.  |

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