**3GPP TSG-RAN WG2 Meeting #110-e *R2-2006108***

**E-meeting, 1st – 12th June 2020**

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| *CR-Form-v11.2* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **1602** | **rev** | **1** | **Current version:** | **16.0.0** |  |
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| *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:***  | CR on SRS-CarrierSwitching |
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| ***Source to WG:*** | ZTE Corporation, Sanechips, Qualcomm Incorporated |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-06-04 |
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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:*** | Based on R2-2002697, for SRS carrier switching function introduced in LTE, the typeA SRS-TPC-PDCCH-Group configuration is defined within PCell’s physicalConfigDedicated (i.e. per-UE configuration), with the definition of “SEQUENCE (SIZE (1..32)) OF SRS-TPC-PDCCH-Config-r14”, each entry of the list corresponds to one serving cell. And the typeB SRS-TPC-PDCCH-Group is defined within SCell’s physicalConfigDedicatedSCell (i.e. per SCell configuration).But, for SRS carrier switching in NR, both typeA and typeB SRS-TPC-PDCCH-Group are defined within a single SRS-CarrierSwitching field, and SRS-CarrierSwitching field can be per serving cell configured. However, for typeA, the IE definition still includes a “SEQUENCE(SIZE(1..32)) OF …” list. Then it is unclear how network provides this list, and the meaning of each entry.Considering PUSCH-less SCells may be configured with different “ srs-SwitchFromServCellIndex” and “srs-SwitchFromServCellIndex”, it makes sense to provide SRS-CarrierSwitching field within each SCell’s ServingCellConfig. Therefore the “SEQUENCE(SIZE(1..32)) OF…” list is meaningless. In addition, for typeB, in fact, there is no need to configure CC set to UE. However, the definition of typeB calls SRS-TPC-PDCCH-Config field. Currently, it is clear from field description that cc-SetIndex and cc-IndexInOneCC-Set can not be configured for typeB. But such statement is missing in the field description of srs-CC-SetIndexlist, so it is ambiguous whether network should configure srs-CC-SetIndexlist with empty list for typeB. In addition, RAN1#97 agreed that the value of cc-SetIndex are 0/1/2. Thus, a clarification is needed that the network does not configure this field to 3 in this release of specification.This CR is provided to solve above issues. |
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| ***Summary of change:*** | 1. Clarify in the field description of typeA, that the network configures at most one entry (the first entry) of typeA, and the first entry corresponds to the uplink carrier in which the SRS-CarrierSwitching field is configured in this release;
2. Clarify in the field description of srs-CC-SetIndexlist, that network does not configure this field for typeB. And remove sentence “The network does not configure this field for *typeB*” from the field description of cc-IndexInOneCC-Set and cc-SetIndex.
3. Clarify in the filed descrption of cc-SetIndex, that network does not configure this field to 3 in this release of specification

**Impact analysis**Impacted 5G architecture options:NR SA, (NG)EN-DC, NE-DC, NR-DCImpacted functionality:SRS carrier switchingInter-operability: 1. If the UE is implementated according to the CR and the network is not, in case network configures more than one entries for typeA, or network configures srs-CC-SetIndexlist, the UE may consider the network provides wrong configuration, and triggers RRC re-establishment.
2. If the network is implementated according to the CR and the UE is not, there is no inter-operability problem.
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| ***Consequences if not approved:*** | For typeA, it is unclear how network configures the “SEQUENCE(SIZE(1..32)) OF” list to UE, and the meaning of each entry is unclear. And it is unclear whether network can configure the field of cc-SetIndex to 3;For typeB, it is unclear whether network should configure an empty list of srs-CC-SetIndexlist to UE. |
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| ***Clauses affected:*** | 6.3.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS 38.331 CR1518  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | CR  |
|  |  |
| ***Other comments:*** |  |

Start of changes

### 6.3.2 Radio resource control information elements

\*\*\*\* ignore non-related part \*\*\*\*

#### – *SRS-CarrierSwitching*

The IE *SRS-CarrierSwitching* is used to configure for SRS carrier switching when PUSCH is not configured and independent SRS power control from that of PUSCH.

*SRS-CarrierSwitching* information element

-- ASN1START

-- TAG-SRS-CARRIERSWITCHING-START

SRS-CarrierSwitching ::= SEQUENCE {

 srs-SwitchFromServCellIndex INTEGER (0..31) OPTIONAL, -- Need M

 srs-SwitchFromCarrier ENUMERATED {sUL, nUL},

 srs-TPC-PDCCH-Group CHOICE {

 typeA SEQUENCE (SIZE (1..32)) OF SRS-TPC-PDCCH-Config,

 typeB SRS-TPC-PDCCH-Config

 } OPTIONAL, -- Need M

 monitoringCells SEQUENCE (SIZE (1..maxNrofServingCells)) OF ServCellIndex OPTIONAL, -- Need M

 ...

}

SRS-TPC-PDCCH-Config ::= SEQUENCE {

 srs-CC-SetIndexlist SEQUENCE (SIZE(1..4)) OF SRS-CC-SetIndex OPTIONAL -- Need M

}

SRS-CC-SetIndex ::= SEQUENCE {

 cc-SetIndex INTEGER (0..3) OPTIONAL, -- Need M

 cc-IndexInOneCC-Set INTEGER (0..7) OPTIONAL -- Need M

}

-- TAG-SRS-CARRIERSWITCHING-STOP

-- ASN1STOP

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| *SRS-CC-SetIndex* field descriptions |
| ***cc-IndexInOneCC-Set***Indicates the CC index in one CC set for Type A (see TS 38.212 [17], TS 38.213 [13], clause 7.3.1, 11.4). The network always includes this field when the *srs-TPC-PDCCH-Group* is set to *typeA.* The network does not configure this field to 3 in this release of specification. |
| ***cc-SetIndex***Indicates the CC set index for Type A associated (see TS 38.212 [17], TS 38.213 [13], clause 7.3.1, 11.4). The network always includes this field when the *srs-TPC-PDCCH-Group* is set to *typeA.*  |

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| *SRS-CarrierSwitching* field descriptions |
| ***monitoringCells***A set of serving cells for monitoring PDCCH conveying SRS DCI format with CRC scrambled by TPC-SRS-RNTI (see TS 38.212 [17], TS 38.213 [13], clause 7.3.1, 11.3). |
| ***srs-SwitchFromServCellIndex***Indicates the serving cell whose UL transmission may be interrupted during SRS transmission on a PUSCH-less SCell. During SRS transmission on a PUSCH-less SCell, the UE may temporarily suspend the UL transmission on a serving cell with PUSCH in the same CG to allow the PUSCH-less SCell to transmit SRS. (see TS 38.214 [19], clause 6.2.1.3). |
| ***srs-TPC-PDCCH-Group***Network configures the UE with either typeA-SRS-TPC-PDCCH-Group or typeB-SRS-TPC-PDCCH-Group, if any. |
| ***typeA***Type A trigger configuration for SRS transmission on a PUSCH-less SCell (see TS 38.213 [13], clause 11.4). In this release, the network configures at most one entry (the first entry) of *typeA*, and the first entry corresponds to the uplink carrier in which the *SRS-CarrierSwitching* field is configured. |
| ***typeB***Type B trigger configuration for SRS transmission on a PUSCH-less SCell (see TS 38.213 [13], clause 11.4). |

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| *SRS-TPC-PDCCH-Config* field descriptions |
| ***srs-CC-SetIndexlist***A list of pairs of [cc-SetIndex; cc-IndexInOneCC-Set] (see TS 38.212 [17], TS 38.213 [13], clause 7.3.1, 11.4). The network does not configure this field for *typeB*. |

End of changes