**3GPP TSG-RAN WG2 Meeting #110-e *R2-200xxxx***

**Elbonia, 1-12 June 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **1676** | **rev** | **-** | **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:***  | SMTC Configuration for PSCell Addition for NR-DC (Option 2) |
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| ***Source to WG:*** | Apple |
| ***Source to TSG:*** | R2  |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-05-20 |
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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:*** | For EN-DC, the SMTC configuration for NR PSCell addition is provided in LTE *RRCConnectionReconfiguration* message.For NR PSCell change in MR-DC, the SMTC configuration is provided in secondaryCellGroup -> SpCellConfig -> reconfigurationWithSync.But for NR-DC, the SMTC configuration for NR PSCell addition and SN change is missing.  |
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| ***Summary of change:*** | Clarify that for PSCell addition SN can provide the smtc configuration for PSCell based on the MN PCell timing. **Impact analysis**Impacted 5G architecture options: NR-DC  Impacted functionality: PSCell Addition and SN change  Inter-operability: * If the UE is implemented according to the CR and the network is not, the UE cannot know the timing information of the target PSCell for the initial cell search if UE is not configured with the *measObjectNR* (incl. SMTC configuration) having the same SSB frequency and subcarrier spacing before.
* If the network is implemented according to the CR and the UE is not, the UE cannot know the timing information of the target PSCell for the initial cell search if UE is not configured with the *measObjectNR* (incl. SMTC configuration) having the same SSB frequency and subcarrier spacing before.
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| ***Consequences if not approved:*** | For PSCell addtion and SN change in NR-DC, the UE cannot know the timing information of the target PSCell for the initial cell search if UE is not configured with the *measObjectNR* (incl. SMTC configuration) having the same SSB frequency and subcarrier spacing before. |
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| ***Clauses affected:*** | 6.3.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 38.306 CR 0341 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |   |
|  |  |
| ***This CR's revision history:*** |  |

--------------------------------- [Change Start] ----------------------------

6.3.2 Radio resource control information elements

– *CellGroupConfig*

The *CellGroupConfig* IE is used to configure a master cell group (MCG) or secondary cell group (SCG). A cell group comprises of one MAC entity, a set of logical channels with associated RLC entities and of a primary cell (SpCell) and one or more secondary cells (SCells).

***CellGroupConfig* information element**

-- ASN1START

-- TAG-CELLGROUPCONFIG-START

-- Configuration of one Cell-Group:

CellGroupConfig ::= SEQUENCE {

 cellGroupId CellGroupId,

 rlc-BearerToAddModList SEQUENCE (SIZE(1..maxLC-ID)) OF RLC-BearerConfig OPTIONAL, -- Need N

 rlc-BearerToReleaseList SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N

 mac-CellGroupConfig MAC-CellGroupConfig OPTIONAL, -- Need M

 physicalCellGroupConfig PhysicalCellGroupConfig OPTIONAL, -- Need M

 spCellConfig SpCellConfig OPTIONAL, -- Need M

 sCellToAddModList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellConfig OPTIONAL, -- Need N

 sCellToReleaseList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellIndex OPTIONAL, -- Need N

 ...,

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 reportUplinkTxDirectCurrent ENUMERATED {true} OPTIONAL -- Cond BWP-Reconfig

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 bap-Address-r16 BIT STRING (SIZE (10)) OPTIONAL, -- Need M

 bh-RLC-ChannelToAddModList-r16 SEQUENCE (SIZE(1..maxLC-ID-Iab-r16)) OF BH-RLC-ChannelConfig-r16 OPTIONAL, -- Need N

 bh-RLC-ChannelToReleaseList-r16 SEQUENCE (SIZE(1..maxLC-ID-Iab-r16)) OF BH-LogicalChannelIdentity-r16 OPTIONAL, -- Need N

 dormancySCellGroups DormancySCellGroups OPTIONAL, -- Need N

 simultaneousTCI-UpdateList-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

 simultaneousTCI-UpdateListSecond-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

 simultaneousSpatial-UpdatedList-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

 simultaneousSpatial-UpdatedListSecond-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL -- Need R

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}

DormancySCellGroups::= SEQUENCE {

 withinActiveTimeToAddModList SEQUENCE (SIZE (1..maxNrofDormancyGroups)) OF DormancyGroup-r16 OPTIONAL, -- Need N

 withinActiveTimeToReleaseList SEQUENCE (SIZE (1..maxNrofDormancyGroups)) OF DormancyGroupID-r16 OPTIONAL, -- Need N

 outsideActiveTimeToAddModList SEQUENCE (SIZE (1..maxNrofDormancyGroups)) OF DormancyGroup-r16 OPTIONAL, -- Cond DormancyWUS

 outsideActiveTimeToReleaseList SEQUENCE (SIZE (1..maxNrofDormancyGroups)) OF DormancyGroupID-r16 OPTIONAL -- Need N

}

-- Serving cell specific MAC and PHY parameters for a SpCell:

SpCellConfig ::= SEQUENCE {

 servCellIndex ServCellIndex OPTIONAL, -- Cond SCG

 reconfigurationWithSync ReconfigurationWithSync OPTIONAL, -- Cond ReconfWithSync

 rlf-TimersAndConstants SetupRelease { RLF-TimersAndConstants } OPTIONAL, -- Need M

 rlmInSyncOutOfSyncThreshold ENUMERATED {n1} OPTIONAL, -- Need S

 spCellConfigDedicated ServingCellConfig OPTIONAL, -- Need M

 ...

}

ReconfigurationWithSync ::= SEQUENCE {

 spCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Need M

 newUE-Identity RNTI-Value,

 t304 ENUMERATED {ms50, ms100, ms150, ms200, ms500, ms1000, ms2000, ms10000},

 rach-ConfigDedicated CHOICE {

 uplink RACH-ConfigDedicated,

 supplementaryUplink RACH-ConfigDedicated

 } OPTIONAL, -- Need N

 ...,

 [[

 smtc SSB-MTC OPTIONAL -- Need S

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}

SCellConfig ::= SEQUENCE {

 sCellIndex SCellIndex,

 sCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Cond SCellAdd

 sCellConfigDedicated ServingCellConfig OPTIONAL, -- Cond SCellAddMod

 ...,

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 smtc SSB-MTC OPTIONAL -- Need S

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 sCellState-r16 ENUMERATED {activated} OPTIONAL -- Need SCellAddSync

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DormancyGroup-r16 ::= SEQUENCE {

 dormancyGroupID-r16 DormancyGroupID-r16,

 dormancySCellList-r16 SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellIndex

}

DormancyGroupID-r16 ::= INTEGER (0..4)

-- TAG-CELLGROUPCONFIG-STOP

-- ASN1STOP

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| ***CellGroupConfig* field descriptions** |
| ***bap-Address***BAP address of node that is hosting this cell group. |
| ***bh-RLC-ChannelToAddModList***Configuration of the MAC Logical Channel, the corresponding backhaul RLC enitities to be added and modified. |
| ***bh-RLC-ChannelToReleaseList***List of MAC Logical Channel, the corresponding backhaul RLC enitities to be released. |
| ***mac-CellGroupConfig***MAC parameters applicable for the entire cell group. |
| ***rlc-BearerToAddModList***Configuration of the MAC Logical Channel, the corresponding RLC entities and association with radio bearers. |
| ***reportUplinkTxDirectCurrent***Enables reporting of uplink and supplementary uplink Direct Current location information upon BWP configuration and reconfiguration. This field is only present when the BWP configuration is modified or any serving cell is added or removed. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. If UE is configured with SUL carrier, UE reports both UL and SUL Direct Current locations. |
| ***rlmInSyncOutOfSyncThreshold***BLER threshold pair index for IS/OOS indication generation, see TS 38.133 [14], table 8.1.1-1. *n1* corresponds to the value 1. When the field is absent, the UE applies the value 0. Whenever this is reconfigured, UE resets N310 and N311, and stops T310, if running. Network does not include this field. |
| ***sCellState***Indicates whether the SCell shall be considered to be in activated state upon SCell configuration. |
| ***sCellToAddModList***List of secondary serving cells (SCells) to be added or modified. |
| ***sCellToReleaseList***List of secondary serving cells (SCells) to be released. |
| ***simultaneousTCI-UpdateList, simultaneousTCI-UpdateListSecond***List of serving cells which can be updated simultaneously for TCI relation with a MAC CE. The simultaneousTCI-UpdateList and simultaneousTCI-UpdateListSecond shall not contain same serving cells. |
| ***simultaneousSpatial-UpdatedList, simultaneousSpatial-UpdatedListSecond***List of serving cells which can be updated simultaneously for spatial relation with a MAC CE. The *simultaneousSpatial-UpdatedList* and *simultaneousSpatial-UpdatedList* shall not contain same serving cells. |
| ***spCellConfig***Parameters for the SpCell of this cell group (PCell of MCG or PSCell of SCG).  |

| ***DormancyGroup* field descriptions** |
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| ***dormancySCellList***List of SCells within the same SCell dormancy group. |
| ***dormancyGroupID***The field indicates an SCell group corresponding to the explicit information field in DCI, i.e., bitmap with 1 bit per *DormancyGroup* for indicating dormancy/non-dormancy of SCells, as specified in TS 38.213. |

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| ***DormancySCellGroups* field descriptions** |
| ***outsideActiveTimeToAddModList***List of Dormancy outside active time SCell groups to be added or modified. The use of the Dormancy outside active time SCell groups is specified in TS 38.213 [13]. |
| ***withinActiveTimeToAddModList***List of Dormancy within active time SCell groups SCell groups to be added or modified. The use of the Dormancy within active time SCell groups is specified in TS 38.213 [13]. |

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| ***ReconfigurationWithSync* field descriptions** |
| ***rach-ConfigDedicated***Random access configuration to be used for the reconfiguration with sync (e.g. handover). The UE performs the RA according to these parameters in the *firstActiveUplinkBWP* (see *UplinkConfig*). |
| ***smtc***The SSB periodicity/offset/duration configuration of target cell for NR PSCell change, NR PCell change and NR PSCell addition. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *spCellConfigCommon*. For case of NR PCell change and NR PSell addition, the *smtc* is based on the timing reference of (source) PCell. For case of NR PSCell change, it is based on the timing reference of source PSCell. If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |

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| ***SCellConfig* field descriptions** |
| ***smtc***The SSB periodicity/offset/duration configuration of target cell for NR SCell addition. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *sCellConfigCommon*. The *smtc* is based on the timing of the SpCell of associated cell group. In case of inter-RAT handover to NR, the timing reference is the NR PCell. In case of intra-NR PCell change (standalone NR) or NR PSCell change (EN-DC), the timing reference is the target SpCell. If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |

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| ***SpCellConfig* field descriptions** |
| ***reconfigurationWithSync***Parameters for the synchronous reconfiguration to the target SpCell. |
| ***rlf-TimersAndConstants***Timers and constants for detecting and triggering cell-level radio link failure. For the SCG, *rlf-TimersAndConstants* can only be set to *setup* and is always included at SCG addition. |
| ***servCellIndex***Serving cell ID of a PSCell. The PCell of the Master Cell Group uses ID = 0. |

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| **Conditional Presence** | **Explanation** |
| *BWP-Reconfig* | The field is optionally present, Need N, if the BWPs are reconfigured or if serving cells are added or removed. Otherwise it is absent.  |
| *DormancyWUS* | The field is optionally present, Need N, if WUS is configured*;* otherwise it is absent. |
| *ReconfWithSync* | The field is mandatory present in case of SpCell change, PSCell addition, SCG resume with NR-DC or (NG)EN-DC, update of required SI for PSCell, and AS security key change; otherwise it is optionally present, need M. The field is absent in the *masterCellGroup* in *RRCResume* and *RRCSetup* messages. |
| *SCellAdd* | The field is mandatory present upon SCell addition; otherwise it is absent, Need M. |
| *SCellAddMod* | The field is mandatory present upon SCell addition; otherwise it is optionally present, need M. |
| *SCellAddSync* | The field is optional present in case of SCell addition, reconfiguration with sync, and resuming an RRC connection. It is absent otherwise. |
| *SCG* | The field is mandatory present in an *SpCellConfig* for the PSCell. It is absent otherwise.  |

--------------------------------- [Change End] -----------------------------