**3GPP TSG-RAN2 Meeting #121R2-230xxxx**

**Athens,Greece 27th Feb – 3rd Mar, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.306** | **CR** | **0870** | **rev** | **1** | **Current version:** | **17.3.0** |  |
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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:***  | Clarification on supportedCellGrouping capability |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | RAN2 |
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| ***Work item code:*** | LTE\_NR\_DC\_CA\_enh-Core |  | ***Date:*** | 2023-02-17 |
|  |  |  |  |  |
| ***Category:*** | **A** |  | ***Release:*** | Rel-17 |
|  | *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)**Rel-19 (Release 19)* |
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| ***Reason for change:*** | In Rel-15, only supporting synchronous NR-DC configuration where all serving cells of the MCG are in FR1 and all serving cells of the SCG are in FR2. In Rel-16, this restriction is removed, and new UE capability signalling *supportedCellGrouping-r16* is introduced to convey the supported mapping of serving cells to Cell Groups.In current 38.306, the *supportedCellGrouping-r16* capability indicates the supported cell grouping IDs through a BIT STRING as requested by the network via *requestedCellGrouping-r16*. According to TS38.331, the fist element in the *requestedCellGrouping-r16* list is referred to by ID#0, the second is referred to by ID#1 and so on. However, it is ambiguous of the mapping relationship between each bit in the bit string and the cell grouping IDs requested by the network. For example, whether one bit or more than one bit corresponds to one ID, and whether the first (leftmost) bit corresponds to ID#0, ID#1, or the last ID number requested by the network. Besides, in current spec, whether *asyncNRDC-r16* is mandatory with capability signalling is still FFS. Considering asynchronous NR-DC is an optional feature introduced in Rel-16, the corresponding UE capability should be defined as optional with capability signalling. |
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| ***Summary of change:*** | Clarify the mapping relationship between the bit string of *supportedCellGrouping-r16* and cell grouping IDs requested by the network. Correct that *asyncNRDC-r16* is optional with capabiltiy signalling. **Impact analysis**Impacted 5G architecture options:NR-DCImpacted functionality:NR-DC cell groupingInter-operability: If the network is implemented according to this CR while the UE is not, the network may misunderstand the UE’s capability on supported NR-DC cell groupings, the UE will trigger RRC re-establishment when a wrong NR-DC conbination is configured by the network.If the UE is implemented according to this CR while the network is not, the network may misunderstand the UE’s capability on supported NR-DC cell groupings, the UE will trigger RRC re-establishment when a wrong NR-DC conbination is configured by the network . |
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| ***Consequences if not approved:*** | There may be misunderstanding between the UE and the network on the supported NR-DC cell grouping capability. |
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| ***Clauses affected:*** | 4.2.7.12  |
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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:*** | Revision-1Correct that *asyncNRDC-r16* is optional with capability signalling. |
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<Start of modification>

#### 4.2.7.12 *NRDC-Parameters*

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***asyncNRDC-r16***Indicates whether the UE supports asynchronous NR-DC with MRTD and MTTD as specified in clause 7.5 and 7.6 of TS 38.133 [5]. If the band combination is comprised of a single band entry for more than two carriers, the UE shall support any permutations of carriers to CGs. If the band combination is comprised of at least two band entries, the carriers corresponding to a band entry shall belong to only one cell group.A UE indicating this capability shall support asynchronous NR-DC configuration where all serving cells of the MCG are in FR1 and all serving cells of the SCG are in FR2. | BC | No | No | No |
| ***condPSCellAdditionNRDC-r17***Indicates whether the UE supports conditional PSCell addition in NR-DC. The UE supporting this feature shall also support 2 trigger events for same execution condition in conditional PSCell addition in NR-DC. | BC | No | No | No |
| ***intraFR-NR-DC-PwrSharingMode1-r16***Indicates whether the UE supports intra-FR NR DC with semi-static power sharing mode1 between MCG and SCG cells of same frequency range as defined in TS 38.213 [11]. If this field is absent, the UE does not support intra-FR NR DC.In case MCG and SCG have cells in different frequency ranges, this field indicates the support of power sharing only between MCG and SCG cells with UL in FR1. | BC | No | No | FR1 only |
| ***intraFR-NR-DC-PwrSharingMode2-r16***Indicates whether the UE supports semi-static power sharing mode2 between MCG and SCG cells of same frequency range for synchronous intra-FR NR DC as defined in TS 38.213 [11]. The UE indicating the support of this also indicates the support of *intraFR-NR-DC-PwrSharingMode1-r16.*In case MCG and SCG have cells in different frequency ranges, this field indicates the support of power sharing only between MCG and SCG cells with UL in FR1. | BC | No | No | FR1 only |
| ***intraFR-NR-DC-DynamicPwrSharing-r16***Indicates the UE support of dynamic power sharing for intra-FR NR DC between MCG and SCG cells of same frequency range with long or short offset as specified in TS 38.213 [11]. The UE indicating the support of this also indicates the support of *intraFR-NR-DC-PwrSharingMode1-r16.*In case MCG and SCG have cells in different frequency ranges, this field indicates the support of power sharing only between MCG and SCG cells with UL in FR1. | BC | No | No | FR1 only |
| ***scg-ActivationDeactivationNRDC-r17***Indicates whether the UE supports activation (with or without RACH) and deactivation on SCG in NR-DC, upon SCG addition and upon reconfiguration of the SCG, as specified in TS 38.331 [9]. A UE supporting this feature shall indicate support of NR-DC as specified in TS 38.331 [9]. For the UE supporting this feature, it is mandatory to report *maxNumberCSI-RS-BFD* and *maxNumberSSB-BFD* for all NR bands of this band combination where the UE supports SpCell. | BC | No | No | No |
| ***scg-ActivationDeactivationResumeNRDC-r17***Indicates whether the UE supports activation (with or without RACH) and deactivation on SCG in NR-DC, upon reception of an *RRCReconfiguration* included in an *RRCResume* message, as specified in TS 38.331 [9]. A UE supporting this feature shall indicate support of NR-DC and of *resumeWithSCG-Config-r16* as specified in TS 38.331 [9]. For the UE supporting this feature, it is mandatory to report *maxNumberCSI-RS-BFD* and *maxNumberSSB-BFD* for all NR bands of this band combination where the UE supports SpCell. | BC | No | No | No |
| ***sfn-SyncNRDC***Indicates the UE supports NR-DC only with SFN and frame synchronization between PCell and PSCell. If not included by the UE supporting NR-DC, the UE supports NR-DC with slot-level synchronization without condition on SFN and frame synchronization. In this release of the specification, the UE shall not report this UE capability. | UE | No | No | No |
| ***supportedCellGrouping-r16***Indicates which NR-DC cell groupings the UE supports for the given NR DC band combination, i.e., mapping of serving cells to MCG and SCG, and the operation mode (synchronous or asynchronous), as requested by the network via *requestedCellGrouping-r16*.The bitmap reported in this field refers to the cell grouping IDs that the network requested in *requestedCellGrouping-r16*. The first (leftmost) bit corresponds to ID#0 (i.e. the first element in *requestedCellGrouping-r16*), the second bit corresponds to ID#1 (i.e. the second element in *requestedCellGrouping-r16*) and so on.NOTE: Irrespective of the indicated *supportedCellGrouping-r16*, the UE shall also support NR-DC where all FR1 serving cells are in the MCG and all FR2 serving cells are in the SCG, as described in *ca-ParametersNRDC*. | BC | No | No | No |

<End of modification>