**3GPP TSG-RAN WG2 Meeting #114-e *R2-210xxxx***

**Electronic meeting, May 19 – 27, 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** |  | **rev** | **-** | **Current version:** | **16.4.1** |  |
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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 to ca-ParametersNR-ForDC | | | | | | | | | |
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| ***Source to WG:*** | Ericsson, Intel | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2021-05-26 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The current definition of ca-ParametersNR-forDC implies that:   1. If, and only if, the UE supports **all** features that it reports for CA also for NR-DC, the UE should include ca-ParametersNRDC but omit all versions of ca-ParametersNR-ForDC(-vXXXX) therein. The NW should then inherit the content of the corresponding ca-ParametersNR(-vXXXX) and assume that the UE supports them for NR-DC as well; 2. If the UE supports one or more features for CA but not for NR-DC (or a feature for NR-DC but not for CA), the UE has to include all the ca-ParametersNR-ForDC(-vXXXX) fields applicable to NR-DC within CA-ParametersNRDC and its extensions;   However, 1) creates compatibility problems between new UEs and legacy gNBs.  For instance, when reporting its capabilities to a legacy gNB, a Rel-16 UE may not include in CA-ParametersNRDC any of the ca-ParametersNR-ForDC from Rel-15 (since it does not support them for NR-DC). But it includes the Rel-16 extension, ca-ParametersNRDC-v1610, since it supports those features for NR-DC.  From the perspective of the legacy gNB, which does not understand the Rel-16 extension, it will find the CA-ParametersNRDC without any Rel-15 fields for ca-ParametersNR-ForDC, and will thus consider that the UE indicated that all its parameters reported for CA in Rel-15 in ca-ParametersNR are also applicable for NR-DC.  Hence, this behaviour is corrected so that the inheritance of ca-ParametersNR(-vXXX) upon absence of ca-ParametersNR-forDC(-vXXX) for NR-DC is handled independently for each extension of ca-ParametersNR-forDC(-vXXX).  For instance, if the UE included ca-ParametersNR-v1540 branch and it also supports those features for NR-DC, it should omit ca-ParametersNR-ForDC-v1540, since the UE capabilities reported in ca-ParametersNR-v1540 shall be inherited to NR-DC as well. If the UE, however, included ca-ParametersNR containing parallelTxSRS-PUCCH-PUSCH, but it does not support parallelTxSRS-PUCCH-PUSCH for NR-DC, it would still have to report ca-ParametersNR-ForDC, but without including parallelTxSRS-PUCCH-PUSCH therein.  In other words, the NR-DC capability is either coming fully from ca-ParametersNR-ForDC(-vXXXX) or fully from ca-ParametersNR(-vXXXX), and not from both these IE “groups”. If ca-ParametersNR-ForDC(-vXXXX) is absent, ca-ParametersNR(-vXXXX) is valid also for NR-DC. If the UE includes ca-ParametersNR-ForDC(-vXXXX), and an IE under ca-ParametersNR-ForDC(-vXXXX) is absent, the capability IE shall be considered absent for NR-DC even if it is present in ca-ParametersNR(-vXXXX). If ca-ParametersNR-ForDC(-vXXXX) is present but empty, none of the capabilities under CA-ParametersNR(-vXXXX) are supported for NR-DC.  **Impact analysis**  Impacted 5G architecture options: NR-DC    Impacted functionality: CA parameters supported for NR-DC    Inter-operability: If the network implements the CR and the UE does not, the UE may omit an NR-DC extension ca-ParametersNR-ForDC(-vXXXX) for the sake of indicating that it does not support the fields therein for NR-DC. However, the network will interpret as the UE inherits the parameters of the omitted extension (ca-ParametersNR-ForDC(-vXXXX)) from the corresponding extension indicated for CA (ca-ParametersNR(-vXXXX)). Hence, the network may attempt to configure the UE with features it does not support for NR-DC.  If the UE implements the CR and the network does not, the UE may omit an NR-DC extension ca-ParametersNR-ForDC(-vXXXX) for the sake of indicating that the UE inherits the parameters of the omitted extension (ca-ParametersNR-ForDC(-vXXXX)) from the corresponding extension indicated for CA (ca-ParametersNR(-vXXXX)). However, the network will interpret as the UE does not support the parameters of the omitted extension (ca-ParametersNR-ForDC(-vXXXX)). Hence, the network may not configure features for NR-DC that the UE may have actually supported.  **This CR is considered mandatory to support the impacted functionality.** | | | | | | | | |
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| ***Summary of change:*** | | 6.3.3 UE capability information elements  *- CA-ParametersNRDC*  - correct so that so that the inheritance of ca-ParametersNR(-vXXX) upon absence of ca-ParametersNR-forDC(-vXXX) for NR-DC is handled independently for each extension of ca-ParametersNR-forDC(-vXXX). | | | | | | | | |
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| ***Consequences if not approved:*** | | A compatibility problem will be present for NR-DC configuration between new UEs and legacy gNBs. | | | | | | | | |
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| ***Clauses affected:*** | | 6.3.3 | | | | | | | | |
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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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

START OF CHANGE

#### – CA-ParametersNRDC

The IE *CA-ParametersNRDC* contains dual connectivity related capabilities that are defined per band combination.

*CA-ParametersNRDC* information element

-- ASN1START

-- TAG-CA-PARAMETERS-NRDC-START

CA-ParametersNRDC ::= SEQUENCE {

ca-ParametersNR-ForDC CA-ParametersNR OPTIONAL,

ca-ParametersNR-ForDC-v1540 CA-ParametersNR-v1540 OPTIONAL,

ca-ParametersNR-ForDC-v1550 CA-ParametersNR-v1550 OPTIONAL,

ca-ParametersNR-ForDC-v1560 CA-ParametersNR-v1560 OPTIONAL,

featureSetCombinationDC FeatureSetCombinationId OPTIONAL

}

CA-ParametersNRDC-v1610 ::= SEQUENCE {

-- R1 18-1: Semi-static power sharing mode1 between MCG and SCG cells of same FR for NR dual connectivity

intraFR-NR-DC-PwrSharingMode1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-1a: Semi-static power sharing mode 2 between MCG and SCG cells of same FR for NR dual connectivity

intraFR-NR-DC-PwrSharingMode2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-1b: Dynamic power sharing between MCG and SCG cells of same FR for NR dual connectivity

intraFR-NR-DC-DynamicPwrSharing-r16 ENUMERATED {short, long} OPTIONAL,

asyncNRDC-r16 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNRDC-v1630 ::= SEQUENCE {

ca-ParametersNR-ForDC-v1610 CA-ParametersNR-v1610 OPTIONAL,

ca-ParametersNR-ForDC-v1630 CA-ParametersNR-v1630 OPTIONAL

}

CA-ParametersNRDC-v1640 ::= SEQUENCE {

ca-ParametersNR-ForDC-v1640 CA-ParametersNR-v1640 OPTIONAL

}

-- TAG-CA-PARAMETERS-NRDC-STOP

-- ASN1STOP

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| *CA-ParametersNRDC* field descriptions |
| ***ca-ParametersNR-forDC (with and without suffix)***  If this field is present for a band combination, it reports the UE capabilities when NR-DC is configured with the band combination. If a version of this field (i.e., with or without suffix) is absent for a band combination, the corresponding *ca-ParametersNR* field version in *BandCombination* is applicable to the UE configured with NR-DC for the band combination. If a version of this field (i.e., with or without suffix) is present for a band combination but does not contain any parameters, the UE does not support the corresponding field version when configured with NR-DC for the band combination. |
| ***featureSetCombinationDC***  If this field is present for a band combination, it reports the feature set combination supported for the band combination when NR-DC is configured. If this field is absent for a band combination, the *featureSetCombination* in *BandCombination* (without suffix) is applicable to the UE configured with NR-DC for the band combination. |

END OF CHANGE