**3GPP TSG-****RAN2 Meeting #109 electronic R2-200xxxx**

**24th Feb – 6th Mar, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **1409** | **rev** | **2** | **Current version:** | **15.8.0** |  |
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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:***  | CR on BWCS for inter-ENDC BC with intra-ENDC BC (38.331) |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | RAN2 |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-02-14 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *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 the RAN4 reply LS R4-1915358, for intra-band EN-DC with LTE CA and/or NR CA inside, UE only needs to indicate the BWCS for intra-band EN-DC; for intra-band EN-DC with additional inter-band LTE CA and/or NR CA, UE needs to indicate the BWCS for intra-band EN-DC, BWCS for inter-band LTE CA and BWCS for inter-band NR CA. Considering backward compatibility issue, introduce a new field indicating the BWCS of intra-band EN-DC component for intra-band EN-DC combination with additional inter-band NR/LTE CA component is agreed. The understanding of current field “supportedBandwidthCombinationSet” and “supportedBandwidthCombinationSetEUTRA” are not changed. |
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| ***Summary of change:*** | 1. Add a new IE indicating the BWCS of intra-band EN-DC component for intra-band EN-DC combination with additional inter-band NR/LTE CA component.**Impact Analysis**Impacted 5G architecture options: EN-DC, NGEN-DC, NE-DCImpacted functionality:UE radio capability Inter-operability:1. If the network is implemented according to the CR and the UE is not, there is no inter-operability problem, the UE won’t report this new IE*.*2. If the UE is implemented according to the CR and the network is not, the UE would report this new IE but the network cannot understand it, the BWCS determined by the network may not be correct*.* |
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| ***Consequences if not approved:*** | The UE cannot indicate the BWCS for LTE CA, NR CA and intra-band EN-DC separately, which may lead to configuration failure. |
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| ***Clauses affected:*** | 6.3.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.306 CR 1409  |
| ***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:*** |  |

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

6.3.3 UE capability information elements

– *AccessStratumRelease*

The IE *AccessStratumRelease* indicates the release supported by the UE.

***AccessStratumRelease* information element**

-- ASN1START

-- TAG-ACCESSSTRATUMRELEASE-START

AccessStratumRelease ::= ENUMERATED {

 rel15, spare7, spare6, spare5, spare4, spare3, spare2, spare1, ... }

-- TAG-ACCESSSTRATUMRELEASE-STOP

-- ASN1STOP

– *BandCombinationList*

The IE *BandCombinationList* contains a list of NR CA and/or MR-DC band combinations (also including DL only or UL only band).

***BandCombinationList* information element**

-- ASN1START

-- TAG-BANDCOMBINATIONLIST-START

BandCombinationList ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination

BandCombinationList-v1540 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1540

BandCombinationList-v1550 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1550

BandCombinationList-v1560 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1560

BandCombinationList-v1570 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1570

BandCombinationList-v1580 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1580

BandCombinationList-v15xy ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v15xy

BandCombination ::= SEQUENCE {

 bandList SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters,

 featureSetCombination FeatureSetCombinationId,

 ca-ParametersEUTRA CA-ParametersEUTRA OPTIONAL,

 ca-ParametersNR CA-ParametersNR OPTIONAL,

 mrdc-Parameters MRDC-Parameters OPTIONAL,

 supportedBandwidthCombinationSet BIT STRING (SIZE (1..32)) OPTIONAL,

 powerClass-v1530 ENUMERATED {pc2} OPTIONAL

}

BandCombination-v1540::= SEQUENCE {

 bandList-v1540 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1540,

 ca-ParametersNR-v1540 CA-ParametersNR-v1540 OPTIONAL

}

BandCombination-v1550 ::= SEQUENCE {

 ca-ParametersNR-v1550 CA-ParametersNR-v1550

}

BandCombination-v1560::= SEQUENCE {

 ne-DC-BC ENUMERATED {supported} OPTIONAL,

 ca-ParametersNRDC CA-ParametersNRDC OPTIONAL,

 ca-ParametersEUTRA-v1560 CA-ParametersEUTRA-v1560 OPTIONAL,

 ca-ParametersNR-v1560 CA-ParametersNR-v1560 OPTIONAL

}

BandCombination-v1570 ::= SEQUENCE {

 ca-ParametersEUTRA-v1570 CA-ParametersEUTRA-v1570

}

BandCombination-v1580 ::= SEQUENCE {

 mrdc-Parameters-v1580 MRDC-Parameters-v1580

}

BandCombination-v15xy::= SEQUENCE {

 supportedBandwidthCombinationSetIntraENDC BIT STRING (SIZE (1..32)) OPTIONAL

}

BandParameters ::= CHOICE {

 eutra SEQUENCE {

 bandEUTRA FreqBandIndicatorEUTRA,

 ca-BandwidthClassDL-EUTRA CA-BandwidthClassEUTRA OPTIONAL,

 ca-BandwidthClassUL-EUTRA CA-BandwidthClassEUTRA OPTIONAL

 },

 nr SEQUENCE {

 bandNR FreqBandIndicatorNR,

 ca-BandwidthClassDL-NR CA-BandwidthClassNR OPTIONAL,

 ca-BandwidthClassUL-NR CA-BandwidthClassNR OPTIONAL

 }

}

BandParameters-v1540 ::= SEQUENCE {

 srs-CarrierSwitch CHOICE {

 nr SEQUENCE {

 srs-SwitchingTimesListNR SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingTimeNR

 },

 eutra SEQUENCE {

 srs-SwitchingTimesListEUTRA SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingTimeEUTRA

 }

 } OPTIONAL,

 srs-TxSwitch SEQUENCE {

 supportedSRS-TxPortSwitch ENUMERATED {t1r2, t1r4, t2r4, t1r4-t2r4, t1r1, t2r2, t4r4, notSupported},

 txSwitchImpactToRx INTEGER (1..32) OPTIONAL,

 txSwitchWithAnotherBand INTEGER (1..32) OPTIONAL

 } OPTIONAL

}

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

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| *BandCombination* field descriptions |
| ***BandCombinationList-v1540, BandCombinationList-v1550, BandCombinationList-v1560, BandCombinationList-v1570, BandCombinationList-v1580, BandCombinationList-v15xy***The UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* (without suffix). |
| ***ca-ParametersNRDC***If the field is included for a band combination in the NR capability container, the field indicates support of NR-DC. Otherwise, the field is absent. |
| ***ne-DC-BC***If the field is included for a band combination in the MR-DC capability container, the field indicates support of NE-DC. Otherwise, the field is absent. |
| ***srs-SwitchingTimesListNR***Indicates, for a particular pair of NR bands, the RF retuning time when switching between a NR carrier corresponding to this band entry and another (PUSCH-less) NR carrier corresponding to the band entry in the order indicated below:- For the first NR band, the UE shall include the same number of entries for NR bands as in *bandList*, i.e. first entry corresponds to first NR band in *bandList* and so on,- For the second NR band, the UE shall include one entry less, i.e. first entry corresponds to the second NR band in *bandList* and so on- And so on |
| ***srs-SwitchingTimesListEUTRA***Indicates, for a particular pair of E-UTRA bands, the RF retuning time when switching between an E-UTRA carrier corresponding to this band entry and another (PUSCH-less) E-UTRA carrier corresponding to the band entry in the order indicated below:- For the first E-UTRA band, the UE shall include the same number of entries for E-UTRA bands as in *bandList,* i.e. first entry corresponds to first E-UTRA band in *bandList* and so on,- For the second E-UTRA band, the UE shall include one entry less, i.e. first entry corresponds to the second E-UTRA band in *bandList* and so on - And so on |

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

– *RF-ParametersMRDC*

The IE *RF-ParametersMRDC* is used to convey RF related capabilities for MR-DC.

***RF-ParametersMRDC* information element**

-- ASN1START

-- TAG-RF-PARAMETERSMRDC-START

RF-ParametersMRDC ::= SEQUENCE {

 supportedBandCombinationList BandCombinationList OPTIONAL,

 appliedFreqBandListFilter FreqBandList OPTIONAL,

 ...,

 [[

 srs-SwitchingTimeRequested ENUMERATED {true} OPTIONAL,

 supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1550 BandCombinationList-v1550 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL,

 supportedBandCombinationListNEDC-Only BandCombinationList OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1570 BandCombinationList-v1570 OPTIONAL

]],

[[

supportedBandCombinationList-v1580 BandCombinationList-v1580 OPTIONAL

]],

[[

supportedBandCombinationList-v15xy BandCombinationList-v15xy OPTIONAL

]]

}

-- TAG-RF-PARAMETERSMRDC-STOP

-- ASN1STOP

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| ***RF-ParametersMRDC* field descriptions** |
| ***appliedFreqBandListFilter***In this field the UE mirrors the *FreqBandList* that the NW provided in the capability enquiry, if any. The UE filtered the band combinations in the *supportedBandCombinationList* in accordance with this *appliedFreqBandListFilter*. |
| ***supportedBandCombinationList***A list of band combinations that the UE supports for MR-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |
| ***supportedBandCombinationListNEDC-Only***A list of band combinations that the UE supports only for NE-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |

---------------------------------------------END OF CHANGE---------------------------------------------