**3GPP TSG-WG2 Meeting #102AH *R2-1810858***

**Montreal, Canada, 2nd – 6th of July 2018**

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** |  | **rev** |  | **Current version:** | **15.2.0** |  |
|  | | | | | | | | |
| *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:*** | |  | | --- | | Power class and P-max | |  | | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | n.a. | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | | ***Date:*** | | 2018-07-04 |
|  |  | | | |  | | |  | |  |
| ***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 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:*** | | **1) FrequencyInfoUL: p-Max:**  The field description does not reveal that this common (broadcast) value relates to the p-Max values(s) conveyed UE-specifically in PhysicalCellGroupConfig  **2) PhysicalCellGroupConfig: p-NR:**  The field description does not reveal that this UE specific value relates to the cell specific value p-Max and to the p-UE-FR1.  **3) PhysicalCellGroupConfig: total limit for all FR1 cells:**  RAN4 requested adding another transmit power restriction applicable to all serving cells operated on FR1. The field is currently missing.  **4) BandCombination: new power class field**:  RAN4 requested the possibility to advertise a power class inside a band combination (e.g. to allow UEs with two TX chains supporting 23 dBm each, to advertise a total transmission power of 26 dBm when operating with both of them)  **4a) BandNR: power class pc4 for FR2**:  RAN4 defined also value pc4 as power class. Currently, the ue-PowerClass in BandNR does not allow to convey this value.  **5) ConfigRestrictModReqSCG: requestedP-MaxFR1**:  The field description for requestedP-MaxFR1 does not reveal that this is the requested power level for the cell  **6) ConfigRestrictInfoSCG: total limit for all FR1 cells**:  The MN should inform the SN about the total per-UE TX power limit (across all FR1 cells). | | | | | | | | |
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| ***Summary of change:*** | | **Note that this CR shows also the changes resulting from the ASN.1 review.**  **The actual changes related to this CR are done with author “Ericsson” (EN-DC only) and “Ericsson SA” (for SA only).**  **1) FrequencyInfoUL: p-Max:**  Add the following clarification for the field description: “*The maximum transmit power that the UE may use on this serving cell may be additionally limited by p-NR (configured for the cell group) and by p-UE-FR1 (configured total for all serving cells operationg on FR1).*”  **2) PhysicalCellGroupConfig: p-NR:**  Add the following clarification for the field description: “*The maximum transmit power that the UE may use may be additionally limited by p-Max (configured in FrequencyInfoUL) and by p-UE-FR1 (configured total for all serving cells operationg on FR1).*”  Rename the field to p-NR-FR1 and clarify that it is only applicable to the serving cells operating on FR1 in this cell group.  **3) PhysicalCellGroupConfig: total limit for all FR1 cells:**  Add the field p-UE-FR1 with a corresponding field description and a condition ensuring that this field is provided only for the UE’s MCG.  **4) BandCombination: new power class field**:  Add a “powerClass” as “ENUMERATED {class2}” to the BandComination IE.  **4a) BandNR: power class pc4 for FR2**:  Add the missing pc4 value (shown as BC change)  **5) ConfigRestrictModReqSCG: requestedP-MaxFR1**:  Clarify in field description that the requestedP-MaxFR1 is the power requested for the serving cells on FR1 in this secondary cell group.  **6) ConfigRestrictInfoSCG: total limit for all FR1 cells**:  Add p-maxUE-FR1 field (NBC in inter-node) and a field description.  Also tag the p-maxNR with an additional “-FR1” to in accordance with the p-NR-FR in PhysicalCellGroupConfig.  **Impact Analysis**  Impacted functionality: UE UL Power control in EN-DC and NR SA  Inter-operability:  If the NW implements the change but the UE does not, the UE cannot comprehend the received PhysicalCellGroupConfig containing the newly added p-UE-FR1 value.  If the UE implements the change but the UE does not, there is no interoperability issue. | | | | | | | | |
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| ***Consequences if not approved:*** | | The NW cannot configure a total UE transmit power when operating in EN-DC.  The UE cannot advertise a different (e.g. higher) transmit power available when configured in accordance with certain band combinations.  It is unclear how the different “p” values relate to each other. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | |  | | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | TS/TR ... CR ... | | | |
| ***affected:*** | | **X** |  | Test specifications | | | TS/TR ... CR ... | | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | TS/TR ... CR ... | | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

#### – *FrequencyInfoUL*

The IE *FrequencyInfoUL* provides basic parameters of an uplink carrier and transmission thereon.

*FrequencyInfoUL* information element

-- ASN1START

-- TAG-FREQUENCY-INFO-UL-START

FrequencyInfoUL ::= SEQUENCE {

frequencyBandList MultiFrequencyBandListNR OPTIONAL, -- Cond FDD-OrSUL

absoluteFrequencyPointA ARFCN-ValueNR OPTIONAL, -- Cond FDD-OrSUL

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

additionalSpectrumEmission AdditionalSpectrumEmission OPTIONAL, -- Need S

p-Max P-Max OPTIONAL, -- Need S

frequencyShift7p5khz ENUMERATED {true} OPTIONAL, -- Cond FDD-OrSUL-Optional

...

}

-- TAG-FREQUENCY-INFO-UL-STOP

-- ASN1STOP

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| --- |
| *FrequencyInfoUL field descriptions* |
| ***absoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. Note that the lower edge of the actual carrier is not defined by this field but rather in the scs-SpecificCarrierList. Corresponds to L1 parameter 'offset-ref-low-scs-ref-PRB' (see 38.211, section FFS\_Section) |
| ***additionalSpectrumEmission***  The additional spectrum emission requirements to be applied by the UE on this uplink. If the field is absent, the UE applies the value FFS\_RAN4. (see FFS\_section, section FFS\_Section) |
| ***frequencyBandList***  List of one or multiple frequency bands to which this carrier(s) belongs. Multiple values are only supported in system information but not when the FrequencyInfoDL is provided in dedicated signalling (HO or S(p)Cell addition). |
| ***frequencyShift7p5khz***  Enable the NR UL transmission with a 7.5KHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***p-Max***  Maximum transmit power allowed in this serving cell. The maximum transmit power that the UE may use on this serving cell may be additionally limited by p-NR-FR1 (configured for the cell group) and by p-UE-FR1 (configured total for all serving cells operationg on FR1). If absent, the UE applies the maximum power according to TS 38.101 [15]. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A. Corresponds to L1 parameter 'offset-pointA-set' (see 38.211, section FFS\_Section) |

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| Conditional Presence | Explanation |
| *FDD-OrSUL* | The field is mandatory present if this FrequencyInfoUL is for the paired UL for a DL (defined in a FrequencyInfoDL) or if this FrequencyInfoUL is for a supplementary uplink (SUL). It is absent otherwise (if this FrequencyInfoUL is for an unpaired UL (TDD). |
| *FDD-OrSUL-Optional* | The field is optionally present, Need R, if this FrequencyInfoUL is for the paired UL for a DL (defined in a FrequencyInfoDL) or if this FrequencyInfoUL is for a supplementary uplink (SUL). It is absent otherwise. |

#### – *PhysicalCellGroupConfig*

The IE *PhysicalCellGroupConfig* is used to configure cell-group specific L1 parameters.

*PhysicalCellGroupConfig* information element

-- ASN1START

-- TAG-PHYSICALCELLGROUPCONFIG-START

PhysicalCellGroupConfig ::= SEQUENCE {

harq-ACK-SpatialBundlingPUCCH ENUMERATED {true} OPTIONAL, -- Need S

harq-ACK-SpatialBundlingPUSCH ENUMERATED {true} OPTIONAL, -- Need S

p-NR-FR1 P-Max OPTIONAL, -- Need R

pdsch-HARQ-ACK-Codebook ENUMERATED {semiStatic, dynamic},

tpc-SRS-RNTI RNTI-Value OPTIONAL, -- Need R

tpc-PUCCH-RNTI RNTI-Value OPTIONAL, -- Need R

tpc-PUSCH-RNTI RNTI-Value OPTIONAL, -- Need R

sp-CSI-RNTI RNTI-Value OPTIONAL, -- Cond SP-CSI-Report

cs-RNTI SetupRelease { RNTI-Value } OPTIONAL, -- Need M

...,

[[

mcs-C-RNTI RNTI-Value OPTIONAL -- Need R,

p-UE-FR1 P-Max OPTIONAL, -- Cond MCG-Only

]]

}

-- TAG-PHYSICALCELLGROUPCONFIG-STOP

-- ASN1STOP

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| --- |
| *PhysicalCellGroupConfig field descriptions* |
| ***cs-RNTI***  RNTI value for downlink SPS (see SPS-Config) and uplink configured grant (see ConfiguredGrantConfig). |
| ***harq-ACK-SpatialBundlingPUCCH***  Enables spatial bundling of HARQ ACKs. It is configured per cell group (i.e. for all the cells within the cell group) for PUCCH reporting of HARQ-ACK. It is only applicable when more than 4 layers are possible to schedule. When the fidld is absent, the spatial bundling is disabled.  Corresponds to L1 parameter 'HARQ-ACK-spatial-bundling' (see 38.213, section FFS\_Section) |
| ***harq-ACK-SpatialBundlingPUSCH***  Enables spatial bundling of HARQ ACKs. It is configured per cell group (i.e. for all the cells within the cell group) for PUSCH reporting of HARQ-ACK. It is only applicable when more than 4 layers are possible to schedule. When the fidld is absent, the spatial bundling is disabled.  Corresponds to L1 parameter 'HARQ-ACK-spatial-bundling' (see 38.213, section FFS\_Section) |
| ***mcs-C-RNTI***  RNTI to indicate use of qam64LowSE for grant-based transmissions. When the MCS-C-RNTI is configured, RNTI scrambling of DCI CRC is used to choose the corresponding MCS table. |
| ***p-NR-FR1***  The maximum total transmit power to be used by the UE in this NR cell group across all serving cells in frequency range 1 (FR1). The maximum transmit power that the UE may use may be additionally limited by p-Max (configured in FrequencyInfoUL) and by p-UE-FR1 (configured total for all serving cells operationg on FR1). |
| ***p-UE-FR1***  The maximum total transmit power to be used by the UE across all serving cells in frequency range 1 (FR1) across all cell groups. The maximum transmit power that the UE may use may be additionally limited by p-Max (configured in FrequencyInfoUL) and by p-NR-FR1 (configured for the cell group). |
| ***pdsch-HARQ-ACK-Codebook***  The PDSCH HARQ-ACK codebook is either semi-static or dynamic. This is applicable to both CA and none CA operation.  Corresponds to L1 parameter 'HARQ-ACK-codebook' (see 38.213, section FFS\_Section) |
| ***sp-CSI-RNTI***  RNTI for Semi-Persistent CSI reporting on PUSCH (see CSI-ReportConfig). Corresponds to L1 parameter 'SPCSI-RNTI' (see 38.214, section 5.2.1.5.2) |
| ***tpc-PUCCH-RNTI***  RNTI used for PUCCH TPC commands on DCI. Corresponds to L1 parameter 'TPC-PUCCH-RNTI' (see 38.213, section 10). |
| ***tpc-PUSCH-RNTI***  RNTI used for PUSCH TPC commands on DCI. Corresponds to L1 parameter 'TPC-PUSCH-RNTI' (see 38.213, section 10) |
| ***tpc-SRS-RNTI***  RNTI used for SRS TPC commands on DCI. Corresponds to L1 parameter 'TPC-SRS-RNTI' (see 38.213, section 10) |

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| Conditional Presence | Explanation |
| *MCG-Only* | This field is optionally present, Need R, in the PhysicalCellGroupConfig of the MCG. It is absent otherwise. |
| *SP-CSI-Report* | The field is mandatory present, Need R, when at least one *CSI-ReportConfig* with *reportConfigType* set to *semiPersistentOnPUSCH* is configured; otherwise it is optionally present, need M. |

### 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-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

}

BandCombination-v15xy ::= SEQUENCE {

powerClass ENUMERATED {pc2} 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

}

}

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

|  |
| --- |
| *BandCombination field descriptions* |
| ***powerClass***  Power class that the UE supports when operating according to this band combination. If the field is absent, the UE supports the default power class. If this power class is higher than the power class that the UE supports on the individual bands of this band combination (ue-PowerClass in BandNR), the latter determines maximum TX power avialable in each band. The UE sets the new power class parameter only in band combinations with two FR1 uplink serving cells. |

======== UNMODIFIED SECTIONS OMITTED ==============

#### – *UE-MRDC-Capability*

The IE *UE-MRDC-Capability* is used to convey the UE Radio Access Capability Parameters for MR-DC, see TS 38.306 [yy].

*UE-MRDC-Capability* information element

-- ASN1START

-- TAG-UE-MRDC-CAPABILITY-START

UE-MRDC-Capability ::= SEQUENCE {

measParametersMRDC MeasParametersMRDC OPTIONAL,

rf-ParametersMRDC RF-ParametersMRDC,

generalParametersMRDC GeneralParametersMRDC-XDD-Diff OPTIONAL,

fdd-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddXDD-Mode OPTIONAL,

tdd-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddXDD-Mode OPTIONAL,

fr1-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddFRX-Mode OPTIONAL,

fr2-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddFRX-Mode OPTIONAL,

featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-MRDC-Capability-v15xy OPTIONAL

}

UE-MRDC-Capability-v15xy ::= SEQUENCE {

rf-ParametersMRDC-v15xy RF-ParametersMRDC-v15xy OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-MRDC-CapabilityAddXDD-Mode ::= SEQUENCE {

measParametersMRDC-XDD-Diff MeasParametersMRDC-XDD-Diff OPTIONAL,

generalParametersMRDC-XDD-Diff GeneralParametersMRDC-XDD-Diff OPTIONAL

}

UE-MRDC-CapabilityAddFRX-Mode ::= SEQUENCE {

measParametersMRDC-FRX-Diff MeasParametersMRDC-FRX-Diff

}

GeneralParametersMRDC-XDD-Diff ::= SEQUENCE {

splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

splitDRB-withUL-Both-MCG-SCG ENUMERATED {supported} OPTIONAL,

srb3 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-UE-MRDC-CAPABILITY-STOP

-- ASN1STOP

|  |
| --- |
| *UE-MRDC-Capability field descriptions* |
| ***featureSetCombinations***  A list of FeatureSetCombination:s for MR-DC. The FeatureSetDownlink:s and FeatureSetUplink:s referred to from these FeatureSetCombination:s are defined in the featureSets list in UE-NR-Capability. |

#### – *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

}

RF-ParametersMRDC-v15xy ::= SEQUENCE {

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. |

#### – *MeasParametersMRDC*

The IE *MeasParametersMRDC* is used to configure FFS

*MeasParametersMRDC* information element

-- ASN1START

-- TAG-MEASPARAMETERSMRDC-START

MeasParametersMRDC ::= SEQUENCE {

measParametersMRDC-Common MeasParametersMRDC-Common OPTIONAL,

measParametersMRDC-XDD-Diff MeasParametersMRDC-XDD-Diff OPTIONAL,

measParametersMRDC-FRX-Diff MeasParametersMRDC-FRX-Diff OPTIONAL

}

MeasParametersMRDC-Common ::= SEQUENCE {

independentGapConfig ENUMERATED {supported} OPTIONAL

}

MeasParametersMRDC-XDD-Diff ::= SEQUENCE {

sftd-MeasPSCell ENUMERATED {supported} OPTIONAL,

sftd-MeasNR-Cell ENUMERATED {supported} OPTIONAL

}

MeasParametersMRDC-FRX-Diff ::= SEQUENCE {

simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

}

-- TAG-MEASPARAMETERSMRDC-STOP

-- ASN1STOP

#### – *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [yy].

*UE-NR-Capability* information element

-- ASN1START

-- TAG-UE-NR-CAPABILITY-START

UE-NR-Capability ::= SEQUENCE {

accessStratumRelease AccessStratumRelease,

pdcp-Parameters PDCP-Parameters,

rlc-Parameters RLC-Parameters OPTIONAL,

mac-Parameters MAC-Parameters OPTIONAL,

phy-Parameters Phy-Parameters,

rf-Parameters RF-Parameters,

measParameters MeasParameters OPTIONAL,

fdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

tdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

fr1-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

featureSets FeatureSets OPTIONAL,

featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-NR-Capability-vxy OPTIONAL

}

UE-NR-Capability-vxy ::= SEQUENCE {

rf-Parameters-v15xy RF-Parameters-v15xy OPTIONAL,

voiceOverMCGBearer ENUMERATED {supported} OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode ::= SEQUENCE {

phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL,

measParametersXDD-Diff MeasParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode ::= SEQUENCE {

phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

measParametersFRX-Diff MeasParametersFRX-Diff OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

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| --- |
| *UE-NR-Capability field descriptions* |
| ***featureSetCombinations***  A list of FeatureSetCombination:s for NR (not for MR-DC). The FeatureSetDownlink:s and FeatureSetUplink:s referred to from these FeatureSetCombination:s are defined in the featureSets list in UE-NR-Capability. |

#### – *Phy-Parameters*

The IE *Phy-Parameters* is used to convey the physical layer capabilities.

*Phy-Parameters* information element

-- ASN1START

-- TAG-PHY-PARAMETERS-START

Phy-Parameters ::= SEQUENCE {

phy-ParametersCommon Phy-ParametersCommon OPTIONAL,

phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

phy-ParametersFR1 Phy-ParametersFR1 OPTIONAL,

phy-ParametersFR2 Phy-ParametersFR2 OPTIONAL

}

Phy-ParametersCommon ::= SEQUENCE {

csi-RS-CFRA-ForHO ENUMERATED {supported} OPTIONAL,

dynamicPRB-BundlingDL ENUMERATED {supported} OPTIONAL,

sp-CSI-ReportPUCCH ENUMERATED {supported} OPTIONAL,

sp-CSI-ReportPUSCH ENUMERATED {supported} OPTIONAL,

nzp-CSI-RS-IntefMgmt ENUMERATED {supported} OPTIONAL,

type2-SP-CSI-Feedback-LongPUCCH ENUMERATED {supported} OPTIONAL,

precoderGranularityCORESET ENUMERATED {supported} OPTIONAL,

dynamicHARQ-ACK-Codebook ENUMERATED {supported} OPTIONAL,

semiStaticHARQ-ACK-Codebook ENUMERATED {supported} OPTIONAL,

spatialBundlingHARQ-ACK ENUMERATED {supported} OPTIONAL,

dynamicBetaOffsetInd-HARQ-ACK-CSI ENUMERATED {supported} OPTIONAL,

pucch-Repetition-F1-3-4 ENUMERATED {supported} OPTIONAL,

ra-Type0-PUSCH ENUMERATED {supported} OPTIONAL,

dynamicSwitchRA-Type0-1-PDSCH ENUMERATED {supported} OPTIONAL,

dynamicSwitchRA-Type0-1-PUSCH ENUMERATED {supported} OPTIONAL,

pdsch-MappingTypeA ENUMERATED {supported} OPTIONAL,

pdsch-MappingTypeB ENUMERATED {supported} OPTIONAL,

interleavingVRB-ToPRB-PDSCH ENUMERATED {supported} OPTIONAL,

interSlotFreqHopping-PUSCH ENUMERATED {supported} OPTIONAL,

type1-PUSCH-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

type2-PUSCH-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

pusch-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

pdsch-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

downlinkSPS ENUMERATED {supported} OPTIONAL,

configuredUL-GrantType1 ENUMERATED {supported} OPTIONAL,

configuredUL-GrantType2 ENUMERATED {supported} OPTIONAL,

pre-EmptIndication-DL ENUMERATED {supported} OPTIONAL,

cbg-TransIndication-DL ENUMERATED {supported} OPTIONAL,

cbg-TransIndication-UL ENUMERATED {supported} OPTIONAL,

cbg-FlushIndication-DL ENUMERATED {supported} OPTIONAL,

dynamicHARQ-ACK-CodeB-CBG-Retx-DL ENUMERATED {supported} OPTIONAL,

rateMatchingResrcSetSemi-Static ENUMERATED {supported} OPTIONAL,

rateMatchingResrcSetDynamic ENUMERATED {supported} OPTIONAL,

bwp-SwitchingDelay ENUMERATED {type1, type2} OPTIONAL,

...

}

Phy-ParametersXDD-Diff ::= SEQUENCE {

dynamicSFI ENUMERATED {supported} OPTIONAL,

twoPUCCH-F0-2-ConsecSymbols ENUMERATED {supported} OPTIONAL,

twoDifferentTPC-Loop-PUSCH ENUMERATED {supported} OPTIONAL,

twoDifferentTPC-Loop-PUCCH ENUMERATED {supported} OPTIONAL,

...

}

Phy-ParametersFRX-Diff ::= SEQUENCE {

dynamicSFI ENUMERATED {supported} OPTIONAL,

oneFL-DMRS-TwoAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

twoFL-DMRS BIT STRING (SIZE (2)) OPTIONAL,

twoFL-DMRS-TwoAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

oneFL-DMRS-ThreeAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

supportedDMRS-TypeDL ENUMERATED {type1, type2} OPTIONAL,

supportedDMRS-TypeUL ENUMERATED {type1, type2} OPTIONAL,

semiOpenLoopCSI ENUMERATED {supported} OPTIONAL,

csi-ReportWithoutPMI ENUMERATED {supported} OPTIONAL,

csi-ReportWithoutCQI ENUMERATED {supported} OPTIONAL,

onePortsPTRS BIT STRING (SIZE (2)) OPTIONAL,

twoPUCCH-F0-2-ConsecSymbols ENUMERATED {supported} OPTIONAL,

pucch-F2-WithFH ENUMERATED {supported} OPTIONAL,

pucch-F3-WithFH ENUMERATED {supported} OPTIONAL,

pucch-F4-WithFH ENUMERATED {supported} OPTIONAL,

freqHoppingPUCCH-F0-2 ENUMERATED {notSupported} OPTIONAL,

freqHoppingPUCCH-F1-3-4 ENUMERATED {notSupported} OPTIONAL,

mux-SR-HARQ-ACK-CSI-PUCCH ENUMERATED {supported} OPTIONAL,

uci-CodeBlockSegmentation ENUMERATED {supported} OPTIONAL,

onePUCCH-LongAndShortFormat ENUMERATED {supported} OPTIONAL,

twoPUCCH-AnyOthersInSlot ENUMERATED {supported} OPTIONAL,

intraSlotFreqHopping-PUSCH ENUMERATED {supported} OPTIONAL,

pusch-LBRM ENUMERATED {supported} OPTIONAL,

pdcch-BlindDetectionCA ENUMERATED {supported} OPTIONAL,

tpc-PUSCH-RNTI ENUMERATED {supported} OPTIONAL,

tpc-PUCCH-RNTI ENUMERATED {supported} OPTIONAL,

tpc-SRS-RNTI ENUMERATED {supported} OPTIONAL,

absoluteTPC-Command ENUMERATED {supported} OPTIONAL,

twoDifferentTPC-Loop-PUSCH ENUMERATED {supported} OPTIONAL,

twoDifferentTPC-Loop-PUCCH ENUMERATED {supported} OPTIONAL,

pusch-HalfPi-BPSK ENUMERATED {supported} OPTIONAL,

pucch-F3-4-HalfPi-BPSK ENUMERATED {supported} OPTIONAL,

almostContiguousCP-OFDM-UL ENUMERATED {supported} OPTIONAL ,

sp-CSI-RS ENUMERATED {supported} OPTIONAL,

sp-CSI-IM ENUMERATED {supported} OPTIONAL,

tdd-MultiDL-UL-SwitchPerSlot ENUMERATED {supported} OPTIONAL,

multipleCORESET ENUMERATED {supported} OPTIONAL,

...

}

Phy-ParametersFR1 ::= SEQUENCE {

pdcchMonitoringSingleOccasion ENUMERATED {supported} OPTIONAL,

scs-60kHz ENUMERATED {supported} OPTIONAL,

pdsch-256QAM-FR1 ENUMERATED {supported} OPTIONAL,

pdsch-RE-MappingFR1 ENUMERATED {n10, n20} OPTIONAL,

...

}

Phy-ParametersFR2 ::= SEQUENCE {

calibrationGapPA ENUMERATED {supported} OPTIONAL,

pdsch-RE-MappingFR2 ENUMERATED {n6, n20} OPTIONAL,

...

}

-- TAG-PHY-PARAMETERS-STOP

-- ASN1STOP

#### – *RF-Parameters*

The IE *RF-Parameters* is used to convey RF-related capabilities for NR operation.

*RF-Parameters* information element

-- ASN1START

-- TAG-RF-PARAMETERS-START

RF-Parameters ::= SEQUENCE {

supportedBandListNR SEQUENCE (SIZE (1..maxBands)) OF BandNR,

supportedBandCombinationList BandCombinationList OPTIONAL,

appliedFreqBandListFilter FreqBandList OPTIONAL

}

RF-Parameters-v15xy ::= SEQUENCE {

supportedBandCombinationList-v15xy BandCombinationList-v15xy OPTIONAL,

...

}

BandNR ::= SEQUENCE {

bandNR FreqBandIndicatorNR,

modifiedMPR-Behaviour BIT STRING (SIZE (8)) OPTIONAL,

mimo-ParametersPerBand MIMO-ParametersPerBand OPTIONAL,

extendedCP ENUMERATED {supported} OPTIONAL,

multipleTCI ENUMERATED {supported} OPTIONAL,

bwp-WithoutRestriction ENUMERATED {supported} OPTIONAL,

bwp-SameNumerology ENUMERATED {upto2, upto4} OPTIONAL,

bwp-DiffNumerology ENUMERATED {upto4} OPTIONAL,

crossCarrierSchedulingDL-SameSCS ENUMERATED {supported} OPTIONAL,

crossCarrierSchedulingUL-SameSCS ENUMERATED {supported} OPTIONAL,

pdsch-256QAM-FR2 ENUMERATED {supported} OPTIONAL,

pusch-256QAM ENUMERATED {supported} OPTIONAL,

ue-PowerClass ENUMERATED {pc2, pc3} OPTIONAL,

rateMatchingLTE-CRS ENUMERATED {supported} OPTIONAL,

...,

[[

ue-PowerClass2 ENUMERATED {pc4} OPTIONAL

]]

}

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *RF-Parameters 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 NR (without MR-DC). The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-NR-Capability* IE. |

======== UNMODIFIED SECTIONS OMITTED ==============

# 11 Radio information related interactions between network nodes

## 11.1 General

This section specifies RRC messages that are transferred between network nodes. These RRC messages may be transferred to or from the UE via another Radio Access Technology. Consequently, these messages have similar characteristics as the RRC messages that are transferred across the NR radio interface, i.e. the same transfer syntax and protocol extension mechanisms apply.

## 11.2 Inter-node RRC messages

### 11.2.1 General

This section specifies RRC messages that are sent either across the X2-, Xn- or the NG-interface, either to or from the gNB, i.e. a single 'logical channel' is used for all RRC messages transferred across network nodes. The information could originate from or be destined for another RAT.

-- ASN1START

-- TAG\_NR-INTER-NODE-DEFINITIONS-START

NR-InterNodeDefinitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

ARFCN-ValueNR,

CellIdentity,

CSI-RS-Index,

GapConfig,

maxBandComb,

maxNrofSCells,

maxNrofServingCells-1,

maxNrofIndexesToReport,

MeasQuantityResults,

MeasResultSCG-Failure,

MeasResultCellListSFTD,

MeasResultList2NR,

P-Max,

PhysCellId,

RadioBearerConfig,

RRCReconfiguration,

ServCellIndex,

SetupRelease,

SSB-Index,

SSB-MTC,

ShortMAC-I,

UE-CapabilityRAT-ContainerList

FROM NR-RRC-Definitions;

-- TAG\_NR-INTER-NODE-DEFINITIONS-STOP

-- ASN1STOP

### 11.2.2 Message definitions

#### – *HandoverCommand*

Editor’s Note: Targeted for completion in Sept 2018.

This message is used to transfer the handover command as generated by the target gNB.

Direction: target gNB to source gNB/source RAN.

*HandoverCommand* message

-- ASN1START

-- TAG-HANDOVER-COMMAND-START

HandoverCommand ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

handoverCommand HandoverCommand-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

HandoverCommand-IEs ::= SEQUENCE {

handoverCommandMessage OCTETSTRING (CONTAINING RRCReconfiguration),

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-HANDOVER-COMMAND-STOP

-- ASN1STOP

|  |
| --- |
| *HandoverCommand* field descriptions |
| ***handoverCommandMessage***  Contains the *RRCReconfiguration* message used to perform handover within NR or handover to NR, as generated (entirely) by the target gNB. |

#### – *HandoverPreparationInformation*

Editor’s Note: Targeted for completion in Sept 2018.

This message is used to transfer the NR RRC information used by the target gNB during handover preparation, including UE capability information.

Direction: source gNB/source RAN to target gNB.

*HandoverPreparationInformation* message

-- ASN1START

-- TAG-HANDOVER-PREPARATION-INFORMATION-START

HandoverPreparationInformation ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

handoverPreparationInformation HandoverPreparationInformation-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

HandoverPreparationInformation-IEs ::= SEQUENCE {

ue-CapabilityRAT-List UE-CapabilityRAT-ContainerList,

sourceConfig OCTETSTRING (CONTAINING RRCReconfiguration),

rrm-Config RRM-Config OPTIONAL,

as-Context AS-Context OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AS-Context ::= SEQUENCE {

reestablishmentInfo SEQUENCE {

sourcePhysCellId PhysCellId,

targetCellShortMAC-I ShortMAC-I,

additionalReestabInfoList ReestabNCellInfoList OPTIONAL

} OPTIONAL,

-- FFS Whether to change e.g. move all re-establishment info to Xx

configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

...

}

ReestabNCellInfoList ::= SEQUENCE ( SIZE (1..maxCellPrep) ) OF ReestabNCellInfo

ReestabNCellInfo::= SEQUENCE{

cellIdentity CellIdentity,

key-gNodeB-Star BITSTRING (SIZE (256)),

shortMAC-I ShortMAC-I

}

RRM-Config ::= SEQUENCE {

ue-InactiveTime ENUMERATED {

s1, s2, s3, s5, s7, s10, s15, s20,

s25, s30, s40, s50, min1, min1s20c, min1s40,

min2, min2s30, min3, min3s30, min4, min5, min6,

min7, min8, min9, min10, min12, min14, min17, min20,

min24, min28, min33, min38, min44, min50, hr1,

hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,

hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,

day2hr12, day3, day4, day5, day7, day10, day14, day19,

day24, day30, dayMoreThan30} OPTIONAL,

candidateCellInfoList MeasResultList2NR OPTIONAL,

...

}

-- TAG-HANDOVER-PREPARATION-INFORMATION-STOP

-- ASN1STOP

|  |
| --- |
| *HandoverPreparationInformation* field descriptions |
| ***as-Context***  Local RAN context required by the target gNB. |
| ***sourceConfig***  The radio resource configuration as used in the source cell. |
| ***rrm-Config***  Local RAN context used mainly for RRM purposes. |
| ***ue-CapabilityRAT-List***  The UE radio access related capabilities concerning RATs supported by the UE. FFS whether certain capabilities are mandatory to provide by source e.g. of target and/or source RAT. |

#### – *CG-Config*

This message is used to transfer the SCG radio configuration as generated by the SgNB.

Direction: Secondary gNB to master gNB or eNB.

*CG-Config* message

-- ASN1START

-- TAG-CG-CONFIG-START

CG-Config ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

cg-Config CG-Config-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CG-Config-IEs ::= SEQUENCE {

scg-CellGroupConfig OCTETSTRING (CONTAINING RRCReconfiguration) OPTIONAL,

scg-RB-Config OCTETSTRING (CONTAINING RadioBearerConfig) OPTIONAL,

configRestrictModReq ConfigRestrictModReqSCG OPTIONAL,

drx-InfoSCG DRX-Info OPTIONAL,

candidateCellInfoListSN OCTETSTRING (CONTAINING MeasResultList2NR) OPTIONAL,

measConfigSN MeasConfigSN OPTIONAL,

selectedBandCombinationNR BandCombinationIndex OPTIONAL,

fr-InfoListSCG FR-InfoList OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

MeasConfigSN ::= SEQUENCE {

measuredFrequenciesSN SEQUENCE (SIZE (1..maxMeasFreqsSN)) OF NR-FreqInfo OPTIONAL,

...

}

NR-FreqInfo ::= SEQUENCE {

measuredFrequency ARFCN-ValueNR OPTIONAL,

...

}

ConfigRestrictModReqSCG ::= SEQUENCE {

requestedBC-MRDC BandCombinationIndex OPTIONAL,

requestedP-MaxFR1 P-Max OPTIONAL,

...

}

BandCombinationIndex ::= INTEGER (1..maxBandComb)

FR-InfoList ::= SEQUENCE (SIZE (1..maxNrofServingCells-1)) OF FR-Info

FR-Info ::= SEQUENCE {

servCellIndex ServCellIndex,

fr-Type ENUMERATED {fr1, fr2}

}

-- TAG-CG-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CG-Config* field descriptions |
| ***candidateCellInfoListSN***  Contains information regarding cells that the source secondary node suggests the target secondary gNB to consider configuring. |
| ***fr-InfoListSCG***  Contains information of FR information of serving cells. |
| ***measuredFrequenciesSN***  Used by SN to indicate a list of frequencies measured by the UE. |
| ***requestedP-MaxFR1***  Requested value for the maximum power for the serving cells on frequency range 1 (FR1) in this secondary cell group (see TS 38.104 [12]) the UE can use in NR SCG. |
| ***requestedBC-MRDC***  Used to request configuring an NR band combination which is forbidden to use by MN. Each entry refers to a band combination numbered according to supportedBandCombination in the UE-MRDC-Capability. |
| ***scg-CellGroupConfig***  Contains the RRCReconfiguration message, used to (re-)configure the SCG configuration upon SCG establishment or modification, as generated (entirely) by the (target) SgNB |
| ***scg-RB-Config***  Contains the IE RadioBearerConfig, used to establish or reconfigure the SCG configuration, used to (re-)configure the SCG RB configuration upon SCG establishment or modification, as generated (entirely) by the (target) SgNB |
| ***selectedBandCombinationNR***  Indicates the band combination selected by SN for the EN-DC. |
| ***configRestrictModReq***  Used by SN to request changes to SCG configuration restrictions previously set by MN to ensure UE capabilities are respected. E.g. can used to request configuring an NR band combination whose use MN has previously forbidden. |

#### *– CG-ConfigInfo*

This message is used by master eNB or gNB to request the SgNB to perform certain actions e.g. to establish, modify or release an SCG. The message may include additional information e.g. to assist the SgNB to set the SCG configuration.It can also be used by a CU to request a DU to perform certain actions, e.g. to establish, modify or release an MCG or SCG.

Direction: Master eNB or gNB to secondary gNB, alternatively CU to DU.

*CG-ConfigInfo* message

-- ASN1START

-- TAG-CG-CONFIG-INFO-START

CG-ConfigInfo ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

cg-ConfigInfo CG-ConfigInfo-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CG-ConfigInfo-IEs ::= SEQUENCE {

ue-CapabilityInfo OCTETSTRING (CONTAINING UE-CapabilityRAT-ContainerList) OPTIONAL,-- Cond SN-Addition

candidateCellInfoListMN MeasResultList2NR OPTIONAL,

candidateCellInfoListSN OCTETSTRING (CONTAINING MeasResultList2NR) OPTIONAL,

measResultCellListSFTD MeasResultCellListSFTD OPTIONAL,

scgFailureInfo SEQUENCE {

failureType ENUMERATED { t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx, scg-ChangeFailure,

scg-reconfigFailure,

srb3-IntegrityFailure},

measResultSCG OCTETSTRING (CONTAINING MeasResultSCG-Failure)

} OPTIONAL,

configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

drx-InfoMCG DRX-Info OPTIONAL,

measConfigMN MeasConfigMN OPTIONAL,

sourceConfigSCG OCTETSTRING (CONTAINING RRCReconfiguration) OPTIONAL,

scg-RB-Config OCTETSTRING (CONTAINING RadioBearerConfig) OPTIONAL,

mcg-RB-Config OCTETSTRING (CONTAINING RadioBearerConfig) OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

ConfigRestrictInfoSCG ::= SEQUENCE {

allowedBC-ListMRDC BandCombinationIndexList OPTIONAL,

powerCoordination-FR1 SEQUENCE {

p-maxNR-FR1 P-Max OPTIONAL,

p-maxEUTRA P-Max OPTIONAL,

p-maxUE-FR1 P-Max OPTIONAL

} OPTIONAL,

servCellIndexRangeSCG SEQUENCE {

lowBound ServCellIndex,

upBound ServCellIndex

} OPTIONAL, -- Cond SN-Addition

maxMeasFreqsSCG-NR INTEGER(1..maxMeasFreqsMN) OPTIONAL,

maxMeasIdentitiesSCG-NR INTEGER(1..maxMeasIdentitiesMN) OPTIONAL,

...

}

BandCombinationIndexList ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationIndex

DRX-Info ::= SEQUENCE {

drx-LongCycleStartOffset CHOICE {

ms10 INTEGER(0..9),

ms20 INTEGER(0..19),

ms32 INTEGER(0..31),

ms40 INTEGER(0..39),

ms60 INTEGER(0..59),

ms64 INTEGER(0..63),

ms70 INTEGER(0..69),

ms80 INTEGER(0..79),

ms128 INTEGER(0..127),

ms160 INTEGER(0..159),

ms256 INTEGER(0..255),

ms320 INTEGER(0..319),

ms512 INTEGER(0..511),

ms640 INTEGER(0..639),

ms1024 INTEGER(0..1023),

ms1280 INTEGER(0..1279),

ms2048 INTEGER(0..2047),

ms2560 INTEGER(0..2559),

ms5120 INTEGER(0..5119),

ms10240 INTEGER(0..10239)

},

shortDRX SEQUENCE {

drx-ShortCycle ENUMERATED {

ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32,

ms35, ms40, ms64, ms80, ms128, ms160, ms256, ms320, ms512, ms640, spare9,

spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1 },

drx-ShortCycleTimer INTEGER (1..16)

} OPTIONAL

}

MeasConfigMN ::= SEQUENCE {

measuredFrequenciesMN SEQUENCE (SIZE (1..maxMeasFreqsMN)) OF NR-FreqInfo OPTIONAL,

measGapConfig SetupRelease { GapConfig } OPTIONAL,

gapPurpose ENUMERATED {perUE, perFR1} OPTIONAL,

...

}

-- TAG-CG-CONFIG-INFO-STOP

-- ASN1STOP

|  |
| --- |
| *CG-ConfigInfo* field descriptions |
| ***allowedBandCombinationListMRDC***  A list of indices referring to band combinations in MR-DC capabilities from which SN is allowed to select an NR band combination. Each entry refers to a band combination numbered according to supportedBandCombination in the UE-MRDC-Capability. All MR-DC band combinations indicated by this field comprise the same LTE band combination. |
| ***candidateCellInfoListMN***, ***candidateCellInfoListSN***  Contains information regarding cells that the master node or the source node suggests the target gNB to consider configuring.  Including CSI-RS measurement results in candidateCellInfoListMN is not supported in this version of the specification. |
| ***maxMeasFreqsSCG-NR***  Indicates the maximum number of NR inter-frequency carriers the SN is allowed to configure with PSCell for measurements. |
| ***maxMeasIdentitiesSCG-NR***  Indicates the maximum number of allowed measurement identities that the SCG is allowed to configure. |
| ***measuredFrequenciesMN***  Used by MN to indicate a list of frequencies measured by the UE. |
| ***measGapConfig***  Indicates the measurement gap configuration configured by MN. |
| ***mcg-RB-Config***  Contains the IE RadioBearerConfig of the MN, used to support delta configuration for bearer type change between MN terminated to SN terminated bearer and SN change. |
| ***p-maxEUTRA***  Indicates the maximum total transmit power to be used by the UE in the EUTRA cell group (see TS 36.104 [XX]). |
| ***p-maxNR-FR1***  Indicates the maximum total transmit power to be used by the UE in the NR cell group across all serving cells in frequency range 1 (FR1) (see TS 38.104 [12]) the UE can use in NR SCG. |
| ***p-maxUE-FR1***  Indicates the maximum total transmit power to be used by the UE across all serving cells in frequency range 1 (FR1). |
| ***powerCoordination-FR1***  Indicates the maximum power that the UE can use in FR1. |
| ***scg-RB-Config***  Contains the IE RadioBearerConfig of the SN, used to support delta configuration e.g. during SN change. This field is absent when master eNB uses full configuration option. |
| ***sourceConfigSCG***  Includes the current dedicated SCG configuration in the same format as the *RRCReconfiguration* message, i.e. not only CellGroupConfig but also e.g. measConfig. This field is absent when master eNB uses full configuration option. |
| ***ConfigRestrictInfo***  Includes fields for which SgNB is explictly indicated to observe a configuration restriction. |
| ***servCellIndexRangeSCG***  Range of serving cell indices that SN is allowed to configure for SCG serving cells. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SN-Addition* | The field is mandatory present upon SN addition. |