**3GPP TSG-RAN WG2 NR Ad-Hoc meeting *R2-18xxxxx***

**Vancouver, Canada, 22nd - 26th January 2018**

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| *CR-Form-v11.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** |  | **rev** |  | **Current version:** | **15.0.0** |  |
|  |
| *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:***  | Updates on UE capabilities |
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| ***Source to WG:*** | Intel Corporation |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2018-02-02 |
|  |  |  |  |  |
| ***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)* |
|  |  |
| ***Reason for change:*** | Update UE capabilities according to the following agreements: 1. Linking MR-DC BCs to BPCs (R2-1800909)
2. BC structure with UL and DL decoupling (R2-181620)
3. BPC capability coordination in MR-DC (R2-1800740)
4. Clarifications on BPC capabilities (R2-1801532)
5. UE capabilities on dynamic power sharing (R2-1801520)
6. L2/3 capabilities (R2-1801608)
7. I.044 (R2-1800955)
8. N.037, N.038, N.040, N.045, N.046, N.221, N.222 (R2-1800831)
9. 5.6, 5.7 to 5.7.1 (E.027), 6.3.3 (C.033, M.052, M.054, Z.078, I.078, I.083. H.277) in RIL 38.331
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|  |  |
| ***Summary of change:*** | 1. Remove “FFS if supportedBasebandProcessingCombination-MRDC is included here or BandCombinationList” in the ASN.1.
2. Fill in the blanks of BandCombinationList with UL and DL decoupling.
3. Add BPC coordination information in SCG-ConfigInfo and SCG-Config.
4. Updates supportedBW-PerCC and modulationOrder as per CC capability.
5. Add dynamicPowerSharing and eutra-BasedTDM in MR-DC container.
6. Update L2/3 capabilities:
* Relocate intraBandAsyncFDD into RF-Parameters in MR-DC container.
* Add intraAndInterF-MeasAndReport and eventA-MeasAndReport into MeasParameters in UE-NR-Capability.
* Add splitSRB-WithOneUL-Path and directSN-Addition into generalParameters in MR-DC container.
* Add fdd-UE-MRDC-Capability, tdd-UE-MRDC-Capability, fdd-UE-NR-Capability, and tdd-UE-NR-Capability.
* Remove “FFS utra, geran-cs, geran-ps and cdma2000-1XRTT”
1. Remove volteOverNR-PDCP from NR ASN.1
2. Change MR-DC to eutra-nr in RAT-Type, add FreqBandList IE and replace requestedFreqBandList by FreqBandList in 5.6.1.4.
3. Update the following changes:
* Change sentence to “if FreqBandList is received:” in 5.6.1.4.
* Change maxSimultaneousBands to maxRequestedBands.
* Add “MN” and “SN” into each basebandProcessingCombinationIndex in LinkedBasebandProcessingCombination.
* Change maxServCell to maxNrofCC.
* Change subCarrierSpacing to supportedSubCarrierSpacingList.
* Clarify maxRateDRB-IP is not supported for EN-DC.
* Remove SupportedBandCombination ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination
* Update field description to remove E-UTRA in RAT-Type
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|  |  |
| ***Consequences if not approved:*** | Specification is incomplete.  |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **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:*** |  |

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| The First Change |

5.6 UE capabilities

5.6.1 UE capability transfer

5.6.1.1 General

Editor’s Note: Targeted for completion in June 2018.5.6.1.2 Initiation

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

5.6.1.3 Reception of the *UECapabilityEnquiry* by the UE

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

5.6.1.4 Compilation of band combinations supported by the UE

The UE shall:

1> if *FreqBandList* is received:

2> compile a list of band combinations, candidate for inclusion in the *UECapabilityInformation* message, only consisting of bands included in *FreqBandList*, and prioritized in the order of *FreqBandList*, (i.e. first include remaining band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on);

2> for each band combination included in the candidate list:

3> if it is regarded as a fallback band combination with the same capabilities of another band combination included in the list of candidates as specified in TS 38.306 [xx]:

4> remove the band combination from the list of candidates.

2> include all band combinations in the candidate list into *supportedBandCombination*.

1> else:

2> include all band combinations supported by the UE into *supportedBandCombination,* excluding fallback band combinations with the same capabilities of another band combination included in the list of band combinations supported by the UE.

5.6.1.5 Compilation of baseband processing combinations supported by the UE

The UE shall:

1> for each band combination included in *supportedBandCombination*:

2> include the baseband processing combination supported for the band combination into *supportedBasebandProcessingCombination*, unless it is already included;

2> if there are the fallback baseband processing combinations of this baseband processing combination as specified in TS 38.306 [xx] for which supported baseband capabilities are different from this baseband processing combination:

3> include the fallback baseband processing combinations into *supportedBasebandProcessingCombination*.

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| The Next Change |

6.3.3 UE capability information elements

*– BandCombinationList*

The IE *BandCombinationList* contains a list of NR CA and/or MR-DC band combinations.

***BandCombinationList* information element**

-- ASN1START

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

BandCombination ::= SEQUENCE {

 bandCombinationDL BandCombinationDL,

 bandCombinationsUL BIT STRING (SIZE (1..maxBandCombUL)) OPTIONAL

}

BandCombinationDL ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandDL-Info

BandDL-Info ::= SEQUENCE {

 frequencyBand FreqBandInformation,

 bandParametersDL BandParametersDL OPTIONAL -- Not included in case of SUL

}

BandCombinationUL-PerBC-DL ::= SEQUENCE (SIZE (1..maxBandCombUL)) OF BandCombinationUL-Parameters

BandCombinationUL-Parameters ::= SEQUENCE {

 bandCombinationUL BandCombinationUL,

 multipleTimingAdvances ENUMERATED {supported} OPTIONAL,

 singleTransmission ENUMERATED {supported} OPTIONAL,

 intraBandSimultaneousTxRx ENUMERATED {supported} OPTIONAL -- FFS per UE or per band Combination

}

BandCombinationUL ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandUL-Info

BandUL-Info ::= SEQUENCE {

 bandParametersUL BandParametersUL OPTIONAL -- Not included in case of DL-only band

}

FreqBandInformation ::= CHOICE {

 bandEUTRA FreqBandIndicatorEUTRA,

 bandNR FreqBandIndicator

}

BandParametersDL ::= SEQUENCE {

 bandwidthClassDL CHOICE {

 ca-BandwidthClassDL-EUTRA CA-BandwidthClassEUTRA,

 ca-BandwidthClassDL CA-BandwidthClass

 },

 scalingFactor0dot75 ENUMERATED {supported} OPTIONAL

}

BandParametersUL ::= SEQUENCE {

 bandwidthClassUL CHOICE {

 ca-BandwidthClassUL-EUTRA CA-BandwidthClassEUTRA,

 ca-BandwidthClassUL CA-BandwidthClass

 },

 scalingFactor0dot75 ENUMERATED {supported} OPTIONAL

}

-- ASN1STOP

*– FreqBandList*

The IE *FreqBandList* is used to contain list of NR and/or E-UTRA frequency bands for which the UE is requested to provide its supported NR CA and/or MR-DC band combinations (i.e. within the UE capability containers for NR and MR-DC, as requested by E-UTRA).

***FreqBandList* information element**

-- ASN1START

FreqBandList ::= SEQUENCE (SIZE (1..maxRequestedBands)) OF FreqBandInformation

FreqBandInformation ::= CHOICE {

 bandEUTRA FreqBandIndicatorEUTRA,

 bandNR FreqBandIndicator

}

-- ASN1STOP

*– RAT-Type*

The IE *RAT-Type* is used to indicate the radio access technology (RAT), including NR, of the requested/ transferred UE capabilities.

***RAT-Type* information element**

-- ASN1START

RAT-Type ::= ENUMERATED {nr, eutra-nr, spare2,spare1, ...}

-- ASN1STOP

*– UE-CapabilityRAT-ContainerList*

The IE *UE-CapabilityRAT-ContainerList* contains a list of containers, one for each RAT for which UE capabilities are transferred, if any.

***UE-CapabilityRAT-ContainerList* information element**

-- ASN1START

UE-CapabilityRAT-ContainerList ::=SEQUENCE (SIZE (0.. maxRAT-CapabilityContainers)) OF UE-CapabilityRAT-Container

UE-CapabilityRAT-Container ::= SEQUENCE {

 rat-Type RAT-Type,

 ueCapabilityRAT-Container OCTET STRING

}

-- ASN1STOP

| ***UECapabilityRAT-ContainerList* field descriptions** |
| --- |
| ***ueCapabilityRAT-Container***Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT:For NR: the encoding of UE capabilities is defined in *UE-NR-Capability*.For MRDC: the encoding of UE capabilities is defined in *UE-MRDC-Capability.* |

*– 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

UE-MRDC-Capability ::= SEQUENCE {

 measParameters-MRDC MeasParameters-MRDC,

 rf-Parameters-MRDC RF-Parameters-MRDC,

 phyLayerParameters-MRDC PhyLayerParameters-MRDC,

 generalParameters-MRDC GeneralParameters-MRDC OPTIONAL,

 fdd-UE-MRDC-Capability XDD-UE-MRDC-Capability OPTIONAL,

 tdd-UE-MRDC-Capability XDD-UE-MRDC-Capability OPTIONAL

 -- FFS on other parameters

}

RF-Parameters-MRDC ::= SEQUENCE {

 supportedBandCombination BandCombinationList,

 dynamicPowerSharing ENUMERATED {supported} OPTIONAL,

 eutra-BasedTDM ENUMERATED {supported} OPTIONAL,

 intraBandAsyncFDD ENUMERATED {supported} OPTIONAL

 -- FFS whether intraBandAsyncFDD is included per UE or per band combination

 -- FFS on other parameters

}

PhyLayerParameters-MRDC ::= SEQUENCE {

 supportedBasebandProcessingCombination-MRDC BasebandProcessingCombination-MRDC

 -- FFS on other parameters

}

BasebandProcessingCombination-MRDC ::= SEQUENCE (SIZE (1..maxBasebandProcComb)) OF LinkedBasebandProcessingCombination

}

LinkedBasebandProcessingCombination ::= SEQUENCE {

 basebandProcessingCombinationIndexMN BasebandProcessingCombinationIndex,

 BasebandProcessingCombinationLinkedIndexSN SEQUENCE (SIZE (1..maxBasebandProcComb)) OF BasebandProcessingCombinationIndex

}

BasebandProcessingCombinationIndex ::= INTEGER (1..maxBasebandProcComb)

MeasParameters-MRDC ::= SEQUENCE {

 intraCarrierConcurrentMeas ENUMERATED {supported} OPTIONAL,

 independentGapConfig ENUMERATED {supported} OPTIONAL,

 sstd-MeasType1 ENUMERATED {supported} OPTIONAL }

GeneralParameters-MRDC ::= SEQUENCE {

 splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

 directSN-Addition ENUMERATED {supported} OPTIONAL

}

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

 intraCarrierConcurrentMeas ENUMERATED {supported} OPTIONAL,

 independentGapConfig ENUMERATED {supported} OPTIONAL,

 sstd-MeasType1 ENUMERATED {supported} OPTIONAL,

 splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

 directSN-Addition ENUMERATED {supported} OPTIONAL

}

--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

UE-NR-Capability ::= SEQUENCE {

 pdcp-Parameters PDCP-Parameters,

 rlc-Parameters RLC-Parameters, -- FFS OPTIONAL

 mac-Parameters MAC-Parameters, -- FFS OPTIONAL

 phyLayerParameters PhyLayerParameters,

 rf-Parameters RF-Parameters,

 measParameters MeasParameters OPTIONAL,

 fdd-UE-NR-Capability XDD-UE-NR-Capability OPTIONAL,

 tdd-UE-NR-Capability XDD-UE-NR-Capability OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

PhyLayerParameters ::= SEQUENCE {

 supportedBasebandProcessingCombination SupportedBasebandProcessingCombination,

 -- FFS on other parameters

}

RF-Parameters ::= SEQUENCE {

 supportedBandListNR SupportedBandListNR,

 supportedBandCombination BandCombinationList,

}

SupportedBandListNR ::= SEQUENCE (SIZE (1..maxBands)) OF BandNR

SupportedBasebandProcessingCombination ::= SEQUENCE (SIZE (1..maxBasebandProcComb)) OF BasebandProcessingCombination

BasebandProcessingCombination ::= SEQUENCE {

 basebandParametersPerBand SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BasebandParametersPerBand

 -- FFS on other parameters

}

BasebandParametersPerBand ::= SEQUENCE {

 ca-BandwidthClassDL CA-BandwidthClass OPTIONAL,

 ca-BandwidthClassUL CA-BandwidthClass OPTIONAL,

 basebandParametersPerCC SEQUENCE (SIZE (1..maxNrofCC)) OF BasebandParametersPerCC,

 -- FFS on other parameters

}

BasebandParametersPerCC ::= SEQUENCE {

 bandwidthPerCC-DL BandwidthPerCC OPTIONAL,

 bandwidthPerCC-UL BandwidthPerCC OPTIONAL,

 supportedMIMO-CapabilityDL MIMO-Capability OPTIONAL,

 supportedMIMO-CapabilityUL MIMO-Capability OPTIONAL,

 supportedModulationOrderDL ModulationOrder OPTIONAL,

 supportedModulationOrderUL ModulationOrder OPTIONAL,

 supportedSubCarrierSpacingList SupportedSubCarrierSpacingList, -- FFS if supportedSubCarrierSpacing is included per Band or per CC and whether to separate one for DL and UL.

 -- FFS on other parameters

}

BandNR ::= SEQUENCE {

 bandNR FreqBandIndicator,

 supportedMIMO-CapabilityDL MIMO-Capability OPTIONAL,

 supportedMIMO-CapabilityUL MIMO-Capability OPTIONAL,

 -- FFS on other parameters

}

CA-BandwidthClass ::= ENUMERATED {a, b, c, d, e, f, ...}

 -- FFS value ranges

MIMO-Capability ::= SEQUENCE {

 -- FFS on the parameters

}

BandwidthPerCC ::= ENUMERATED {TBD}

 -- FFS value ranges

ModulationOrder ::= SEQUENCE {

 -- FFS on the parameters

}

SupportedSubCarrierSpacingList ::= SEQUENCE {

 -- FFS on the parameters

}

PDCP-Parameters ::= SEQUENCE {

 dataRateDRB-IP ENUMERATED {64kbps, spare7, spare6, spare5, spare4, spare3, spare2, spare1} OPTIONAL, -- Not supported for EN-DC.

 supportedROHC-Profiles SEQUENCE {

 profile0x0000 BOOLEAN,

 profile0x0001 BOOLEAN,

 profile0x0002 BOOLEAN,

 profile0x0003 BOOLEAN,

 profile0x0004 BOOLEAN,

 profile0x0006 BOOLEAN,

 profile0x0101 BOOLEAN,

 profile0x0102 BOOLEAN,

 profile0x0103 BOOLEAN,

 profile0x0104 BOOLEAN

 },

 maxNumberROHC-ContextSessions ENUMERATED {cs2, cs4, cs8, cs12, cs16, cs24, cs32, cs48, cs64, cs128, cs256, cs512, cs1024, cs16384, spare2, spare1},

 uplinkOnlyROHC-Profiles ENUMERATED {supported} OPTIONAL,

 continueROHC-Context ENUMERATED {supported} OPTIONAL,

 outOfOrderDelivery ENUMERATED {supported} OPTIONAL,

 shortSN ENUMERATED {supported} OPTIONAL,

}

RLC-Parameters ::= SEQUENCE {

 amWithShortSN ENUMERATED {supported} OPTIONAL,

 umWithShortSN ENUMERATED {supported} OPTIONAL,

 umWIthLongSN ENUMERATED {supported} OPTIONAL

}

MAC-Parameters ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

 longDRX-Cycle ENUMERATED {supported} OPTIONAL,

 shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

 numberOfSR-Configurations ENUMERATED {n2, n3, n4,…} OPTIONAL, -- FFS value range

 numberOfConfiguredGrantConfigurations ENUMERATED {n2, n3, n4,…} OPTIONAL -- FFS value range

}

MeasParameters ::= SEQUENCE {

 intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

 eventA-MeasAndReport ENUMERATED {supported} OPTIONAL

}

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

 skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

 longDRX-Cycle ENUMERATED {supported} OPTIONAL,

 shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

 numberOfSR-Configurations ENUMERATED {n2, n3, n4,…} OPTIONAL, -- FFS value range

 numberOfConfiguredGrantConfigurations ENUMERATED {n2, n3, n4,…} OPTIONAL, -- FFS value range

 intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

 eventA-MeasAndReport ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

6.3.4 Other information elements

6.4 RRC multiplicity and type constraint values

– Multiplicity and type constraint definitions

-- ASN1START

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-START

maxBandComb INTEGER ::= FFS -- Maximum number of DL band combinations

maxBandCombUL INTEGER ::= FFS -- Maximum number of UL band combinations

maxBasebandProcComb INTEGER ::= FFS -- Maximum number of base band processing combinations

maxNrofSCells INTEGER ::= 15 -- Max number of secondary serving cells per cell group

maxNrofCellMeas INTEGER ::= FFS -- Maximum number of entries in each of the cell lists in a measurement object

maxNroSS-BlocksToAverage INTEGER ::= FFS -- Max number for the (max) number of SS blocks to average to determine cell measurement

maxNroCSI-RS-ResourcesToAverage INTEGER ::= FFS -- Max number for the (max) number of CSI-RS to average to determine cell measurement

maxNrofSR-CongigPerCellGroup INTEGER ::= 8 -- Maximum number of SR configurations per cell group

maxLCG-ID INTEGER ::= 7 -- Maximum value of LCG ID

macLC-ID INTEGER ::= FFS -- Maximum value of Logical Channel ID

maxNrofTAGs INTEGER ::= 4 -- Maximum number of Timing Advance Groups

maxNrofTAGs-1 INTEGER ::= 3 -- Maximum number of Timing Advance Groups minus 1

maxNrofBandwidthParts INTEGER ::= 4 -- Maximum number of BWPs per serving cell

maxNrofBandwidthParts-1 INTEGER ::= 3 -- Maximum number of BWPs per serving cell minus 1

maxSymbolIndex INTEGER ::= 13 -- Maximum index identifying a symbol within a slot (14 symbols, indexed from 0..13)

maxNrofPhysicalResourceBlocks INTEGER ::= 275 -- Maximum number of PRBs

maxNrofPhysicalResourceBlocks-1 INTEGER ::= 274 -- Maximum number of PRBs

maxNrofPhysicalResourceBlocksTimes4 INTEGER ::= FFS:1100 -- Maximum number of PRBs (used to reference PRBs in another subcarrier spacing)

maxNrofControlResourceSets INTEGER ::= FFS -- Max number of CoReSets configurable on a serving cell

maxNrofControlResourceSets-1 INTEGER ::= FFS -- Max number of CoReSets configurable on a serving cell minus 1

maxCoReSetStartSymbol INTEGER ::= FFS -- Highest possible start symbol for a control resource set

maxCoReSetDuration INTEGER ::= 3 -- Max number of OFDM symbols in a control resource set

maxNrofSearchSpacesPerCoReSet INTEGER ::= FFS -- Max number of search spaces configurable per Control Resource Set

maxNrofRateMatchPatterns INTEGER ::= FFS -- Max number of rate matching patterns that may be configured

maxNrofRateMatchPatterns-1 INTEGER ::= FFS -- Max number of rate matching patterns that may be configured minus 1

maxNrofCSI-Reports INTEGER ::= FFS -- Maximum number of report configurations

maxNrofCSI-Reports-1 INTEGER ::= FFS -- Maximum number of report configurations minus 1

maxNrofCSI-ResourceConfigurations INTEGER ::= FFS -- Maximum number of resource configurations

maxNrofCSI-ResourceConfigurations-1 INTEGER ::= FFS -- Maximum number of resource configurations minus 1

maxNrofCSI-ResourceSets INTEGER ::= FFS -- Maximum number of resource sets per resource configuration

maxNrofCSI-ResourceSets-1 INTEGER ::= FFS -- Maximum number of resource sets per resource configuration minus 1

maxNrofNZP-CSI-RS-Resources INTEGER ::= FFS -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources

maxNrofNZP-CSI-RS-Resources-1 INTEGER ::= FFS -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources minus 1

maxNrofZP-CSI-RS-Resources INTEGER ::= FFS -- Maximum number of Zero-Power (NZP) CSI-RS resources

maxNrofZP-CSI-RS-Resources-1 INTEGER ::= FFS -- Maximum number of Zero-Power (NZP) CSI-RS resources minus 1

maxNrofCSI-IM-Resources INTEGER ::= FFS -- Maximum number of CSI-IM resources. See CSI-IM-ResourceMax in 38.214.

maxNrofCSI-IM-Resources-1 INTEGER ::= FFS -- Maximum number of CSI-IM resources minus 1. See CSI-IM-ResourceMax in 38.214.

maxNrofSSB-Resources INTEGER ::= 64 -- Maximum number of SSB resources in a resource set

maxNrofSSB-Resources-1 INTEGER ::= 63 -- Maximum number of SSB resources in a resource set minus 1

maxNrofCSI-RS-ResourcesPerSet INTEGER ::= 8 -- Maximum number of CSI-RS resources per resource set

maxNrofCSI-MeasId INTEGER ::= FFS -- Maximum number of link configurations

maxNrofCSI-MeasId-1 INTEGER ::= FFS -- Maximum number of link configurations minus 1

maxNrofCSI-RS-ResourcesRRM INTEGER ::= FFS -- Maximum number of CSI-RS resources for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= FFS -- Maximum number of CSI-RS resources for an RRM measurement object minus 1

maxNrofObjectId INTEGER ::= FFS -- Maximum number of configured measurement objects

maxNrOfRA-PreamblesPerSSB INTEGER ::= FFS -- Maximum number of Random Access Preamble value per SSB

maxNrofReportConfigId INTEGER ::= FFS -- Maximum number of reporting configurations

maxNrofMeasId INTEGER ::= FFS -- Maximum number of configured measurements

maxNroQuantityConfig INTEGER ::= 2 -- Maximum number of quantity configurations

maxNrofSRS-ResourceSets INTEGER ::= FFS -- Maximum number of SRS resource sets.

maxNrofSRS-ResourceSets-1 INTEGER ::= FFS -- Maximum number of SRS resource sets minus 1.

maxNrofSRS-Resources INTEGER ::= FFS -- Maximum number of SRS resources in an SRS resource set.

maxNrofSRS-Resources-1 INTEGER ::= FFS -- Maximum number of SRS resources in an SRS resource set minus 1.

maxRA-PreambleIndex INTEGER ::= FFS -- Maxximum value of Random Access Preamble Index

maxRAT-CapabilityContainers INTEGER ::= FFS -- Maximum number of interworking RAT containers (incl NR and MRDC)

maxRequestedBands INTEGER ::= FFS -- Maximum number of simultaneously requested bands

maxNrofCC INTEGER ::= FFS -- Maximum number of carriers

maxSimultaneousBands INTEGER ::= FFS -- Maximum number of simultaneously aggregated bands

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-STOP

-- ASN1STOP

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| The Next Change |

– *SCG-Config*

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

Direction: Secondary gNB to master gNB or eNB

***SCG-Config* message**

-- ASN1START

-- TAG-SCG-CONFIG-START

SCG-Config ::= SEQUENCE {

 criticalExtensions CHOICE {

 c1 CHOICE{

 scg-Config-r15 SCG-Config-r15-IEs,

 spare3 NULL, spare2 NULL, spare1 NULL

 },

 criticalExtensionsFuture SEQUENCE {}

 }

}

SCG-Config-r15-IEs ::= SEQUENCE {

 scg-CellGroupdConfig OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

 p-maxFR1 P-Max OPTIONAL,

 scg-RB-Config OCTET STRING (CONTAINING RadioBearerConfiguration) OPTIONAL,

 configRestrictModReq ConfigRestrictModReqSCG OPTIONAL,

 candidateCellInfoList CandidateCellInfoList OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

ConfigRestrictModReqSCG ::= SEQUENCE {

 requestedBC-List-NR SEQUENCE OF INTEGER OPTIONAL,

 requestedBPC-List-NR BasebandProcessingCombinationList OPTIONAL,

 -- FFS Signalling details of BC requested by SgNB to be alleviated

 ...

}

BasebandProcessingCombinationList ::= SEQUENCE (SIZE (1..maxBasebandProcComb)) OF BasebandProcessingCombinationIndex

BasebandProcessingCombinationIndex ::= INTEGER (1..maxBasebandProcComb)

-- TAG-SCG-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SCG-Config field descriptions*** |
| ***p-maxFR1***Indicates the maximum power for FR1 (see TS 38.104 [12]) the UE can use in NR SCG. |
| ***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 |
| ***configRestrictModReq***Used by SN to re-negotiate SCG configuration restrictions previously set by MN to ensure UE capabilities are respected. E.g. used to request configure an NR band combination which use MN has previously forbidden. |

– *SCG-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.

Direction: Master eNB or gNB to secondary gNB

***SCG-ConfigInfo* message**

-- ASN1START

-- TAG-SCG-CONFIG-INFO-START

SCG-ConfigInfo ::= SEQUENCE {

 criticalExtensions CHOICE {

 c1 CHOICE{

 scg-ConfigInfo-r15 SCG-ConfigInfo-r15-IEs,

 spare3 NULL, spare2 NULL, spare1 NULL

 },

 criticalExtensionsFuture SEQUENCE {}

 }

}

SCG-ConfigInfo-r15-IEs ::= SEQUENCE {

 eutra-CapabilityInfo OCTET STRING (CONTAINING UECapabilityInformation) OPTIONAL,

 candidateCellInfoList CandidateCellInfoList OPTIONAL,

 measResultSSTD MeasResultSSTD OPTIONAL,

 configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

 drx-InfoMCG DRX-Info OPTIONAL,

 sourceConfigSCG OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

 p-maxFR1 P-Max OPTIONAL,

 mcg-RB-Config OCTET STRING (CONTAINING RadioBearerConfiguration) OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

ConfigRestrictInfoSCG ::= SEQUENCE {

 restrictedBandCombinationNR INTEGER OPTIONAL,

 restrictedBasebandCombinationNR BasebandProcessingCombinationList OPTIONAL,

 -- FFS Signalling details of BC restrictions to be observed by SgNB

 -- FFS Signalling details regarding power coordination

 maxMeasFreqsSCG-NR INTEGER OPTIONAL,

 ...

}

DRX-Info ::= SEQUENCE {

 cycle INTEGER,

 offset INTEGER

}

BasebandProcessingCombinationList ::= SEQUENCE (SIZE (1..maxBasebandProcComb)) OF BasebandProcessingCombinationIndex

BasebandProcessingCombinationIndex ::= INTEGER (1..maxBasebandProcComb)

-- TAG-SCG-CONFIG-INFO-STOP

-- ASN1STOP

|  |
| --- |
| ***SCG-ConfigInfo field descriptions*** |
| ***candidateCellInfoList***Contains information regarding cells that the source suggests the target gNB to consider configuring. |
| ***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-maxFR1***Indicates the maximum power for FR1 (see TS 38.104 [12]) the UE can use in NR SCG. |
| ***sourceConfigSCG***Includes the current dedicated SCG configuration in the same format as SCG-Config, i.e. not only CellGroupConfig but also e.g. rb-Config, measConfig. |
| ***ConfigRestrictInfo***Includes fields for which SgNB is explictly indicated to observe a configuration restriction. |
| ***restrictedBandCombinationNR***Indicates restrictions regarding the NR BCs the SN can configure by signalling the LTE BC selected by MN. The SN may configure any EN-BC including the indicated LTE BC selected by MN. |
| ***restrictedBasebandCombinationNR***Indicates restrictions regarding the NR BPCs the SN can/ cannot configure i.e. by signalling the list of NR BPC the SN may configure. |