**3GPP TSG RAN WG2 Meeting #113e R2-21xxxxx**

**Electronic meeting, 25th Jan – 5th Feb, 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.331** | **CR** | - | **rev** | **-** | **Current version:** | **16.3.1** |  |
|  | | | | | | | | |
| *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:*** | Release-16 UE capabilities based on updated RAN1 and RAN4 feature lists | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Apple Inc | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_RF\_FR1-Core | | | | |  | ***Date:*** | | | 2021-03-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***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:*** | | To provide the signalling changes needed to allow the UE to report additional Tx DC location for intra-band UL CA in FR1. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | New Release-16 capabilities and changes are added based on the latest RAN1 and RAN4 feature list.   1. R1-2102006 Updated Rel16\_RAN1\_UE feature List 2. R4-2103367 RAN4 UE features list | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | New RAN1 and RAN4 related UE capabilities and changes will not be captured in specifcations | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.3.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **Y** |  | Other core specifications | | | | TS 38.306 CR xxx | | |
| ***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*

– *BandCombinationList*

The IE *BandCombinationList* contains a list of NR CA, NR non-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-v1590 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1590

BandCombinationList-v1610 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1610

BandCombinationList-v1630 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1630

BandCombinationList-v16xy ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v16xy

BandCombinationList-UplinkTxSwitch-r16 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-r16

BandCombinationList-UplinkTxSwitch-v1630 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1630

BandCombinationList-UplinkTxSwitch-v16xy ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v16xy

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-v1590::= SEQUENCE {

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

mrdc-Parameters-v1590 MRDC-Parameters-v1590

}

BandCombination-v1610 ::= SEQUENCE {

bandList-v1610 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1610 OPTIONAL,

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

ca-ParametersNRDC-v1610 CA-ParametersNRDC-v1610 OPTIONAL,

powerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

powerClassNRPart-r16 ENUMERATED {pc1, pc2, pc3, pc5} OPTIONAL,

featureSetCombinationDAPS-r16 FeatureSetCombinationId OPTIONAL,

mrdc-Parameters-v1620 MRDC-Parameters-v1620 OPTIONAL

}

BandCombination-v1630 ::= SEQUENCE {

ca-ParametersNR-v1630 CA-ParametersNR-v1630 OPTIONAL,

ca-ParametersNRDC-v1630 CA-ParametersNRDC-v1630 OPTIONAL,

mrdc-Parameters-v1630 MRDC-Parameters-v1630 OPTIONAL,

supportedTxBandCombListPerBC-Sidelink-r16 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

supportedRxBandCombListPerBC-Sidelink-r16 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

scalingFactorTxSidelink-r16 SEQUENCE (SIZE (1..maxBandComb)) OF ScalingFactorSidelink-r16 OPTIONAL,

scalingFactorRxSidelink-r16 SEQUENCE (SIZE (1..maxBandComb)) OF ScalingFactorSidelink-r16 OPTIONAL

}

BandCombination-v16xy ::= SEQUENCE {

ca-ParametersNR-v16xy CA-ParametersNR-v16xy OPTIONAL,

ca-ParametersNRDC-v16xy CA-ParametersNRDC-v16xy OPTIONAL,

}

BandCombination-UplinkTxSwitch-r16 ::= SEQUENCE {

bandCombination-r16 BandCombination,

bandCombination-v1540 BandCombination-v1540 OPTIONAL,

bandCombination-v1560 BandCombination-v1560 OPTIONAL,

bandCombination-v1570 BandCombination-v1570 OPTIONAL,

bandCombination-v1580 BandCombination-v1580 OPTIONAL,

bandCombination-v1590 BandCombination-v1590 OPTIONAL,

bandCombination-v1610 BandCombination-v1610 OPTIONAL,

supportedBandPairListNR-r16 SEQUENCE (SIZE (1..maxULTxSwitchingBandPairs)) OF ULTxSwitchingBandPair-r16,

uplinkTxSwitching-OptionSupport-r16 ENUMERATED {switchedUL, dualUL, both} OPTIONAL,

uplinkTxSwitching-PowerBoosting-r16 ENUMERATED {supported} OPTIONAL,

...

}

BandCombination-UplinkTxSwitch-v1630 ::= SEQUENCE {

bandCombination-v1630 BandCombination-v1630 OPTIONAL

}

BandCombination-UplinkTxSwitch-v16xy ::= SEQUENCE {

bandCombination-v16xy BandCombination-v16xy OPTIONAL

}

ULTxSwitchingBandPair-r16 ::= SEQUENCE {

bandIndexUL1-r16 INTEGER(1..maxSimultaneousBands),

bandIndexUL2-r16 INTEGER(1..maxSimultaneousBands),

uplinkTxSwitchingPeriod-r16 ENUMERATED {n35us, n140us, n210us},

uplinkTxSwitching-DL-Interruption-r16 BIT STRING (SIZE(1..maxSimultaneousBands)) 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

}

BandParameters-v1610 ::= SEQUENCE {

srs-TxSwitch-v1610 SEQUENCE {

supportedSRS-TxPortSwitch-v1610 ENUMERATED {t1r1-t1r2, t1r1-t1r2-t1r4, t1r1-t1r2-t2r2-t2r4, t1r1-t1r2-t2r2-t1r4-t2r4,

t1r1-t2r2, t1r1-t2r2-t4r4}

} OPTIONAL

}

ScalingFactorSidelink-r16 ::= ENUMERATED {f0p4, f0p75, f0p8, f1}

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***BandCombination* field descriptions** |
| ***BandCombinationList-v1540, BandCombinationList-v1550, BandCombinationList-v1560, BandCombinationList-v1570, BandCombinationList-v1580, BandCombinationList-v1590, BandCombinationList-r16***  The UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* (without suffix). If the field is included in *supportedBandCombinationListNEDC-Only-v1610*, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* of *supportedBandCombinationListNEDC-Only* (without suffix) field.  If the field is included in *supportedBandCombinationListNEDC-Only-v15a0*, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* (without suffix) of *supportedBandCombinationListNEDC-Only* (without suffix) field. |
| ***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. |
| ***featureSetCombinationDAPS***  If this field is present for a band combination, it reports the feature set combination supported for the band combination when any DAPS bearer is configured. |
| ***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 |
| ***srs-TxSwitch***  Indicates supported SRS antenna switch capability for the associated band. If the UE indicates support of *SRS-SwitchingTimeNR*, the UE is allowed to set this field for a band with associated *FeatureSetUplinkId* set to 0 for SRS carrier switching. | |

*Next change*

– *CA-ParametersNR*

The IE *CA-ParametersNR* contains carrier aggregation and inter-frequency DAPS handover related capabilities that are defined per band combination.

***CA-ParametersNR* information element**

-- ASN1START

-- TAG-CA-PARAMETERSNR-START

CA-ParametersNR ::= SEQUENCE {

dummy ENUMERATED {supported} OPTIONAL,

parallelTxSRS-PUCCH-PUSCH ENUMERATED {supported} OPTIONAL,

parallelTxPRACH-SRS-PUCCH-PUSCH ENUMERATED {supported} OPTIONAL,

simultaneousRxTxInterBandCA ENUMERATED {supported} OPTIONAL,

simultaneousRxTxSUL ENUMERATED {supported} OPTIONAL,

diffNumerologyAcrossPUCCH-Group ENUMERATED {supported} OPTIONAL,

diffNumerologyWithinPUCCH-GroupSmallerSCS ENUMERATED {supported} OPTIONAL,

supportedNumberTAG ENUMERATED {n2, n3, n4} OPTIONAL,

...

}

CA-ParametersNR-v1540 ::= SEQUENCE {

simultaneousSRS-AssocCSI-RS-AllCC INTEGER (5..32) OPTIONAL,

csi-RS-IM-ReceptionForFeedbackPerBandComb SEQUENCE {

maxNumberSimultaneousNZP-CSI-RS-ActBWP-AllCC INTEGER (1..64) OPTIONAL,

totalNumberPortsSimultaneousNZP-CSI-RS-ActBWP-AllCC INTEGER (2..256) OPTIONAL

} OPTIONAL,

simultaneousCSI-ReportsAllCC INTEGER (5..32) OPTIONAL,

dualPA-Architecture ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1550 ::= SEQUENCE {

dummy ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1560 ::= SEQUENCE {

diffNumerologyWithinPUCCH-GroupLargerSCS ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1610 ::= SEQUENCE {

-- R1 9-3: Parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in inter-band CA

parallelTxMsgA-SRS-PUCCH-PUSCH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 9-4: MsgA operation in a band combination including SUL

msgA-SUL-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-9c: Joint search space group switching across multiple cells

jointSearchSpaceGroupSwitchingAcrossCells-r16 ENUMERATED {supported} OPTIONAL,

-- R1 14-5: Half-duplex UE behaviour in TDD CA for same SCS

half-DuplexTDD-CA-SameSCS-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-4: SCell dormancy within active time

scellDormancyWithinActiveTime-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-4a: SCell dormancy outside active time

scellDormancyOutsideActiveTime-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-6: Cross-carrier A-CSI RS triggering with different SCS

crossCarrierA-CSI-trigDiffSCS-r16 ENUMERATED {higherA-CSI-SCS,lowerA-CSI-SCS,both} OPTIONAL,

-- R1 18-6a: Default QCL assumption for cross-carrier A-CSI-RS triggering

defaultQCL-CrossCarrierA-CSI-Trig-r16 ENUMERATED {diffOnly, both} OPTIONAL,

-- R1 18-7: CA with non-aligned frame boundaries for inter-band CA

interCA-NonAlignedFrame-r16 ENUMERATED {supported} OPTIONAL,

simul-SRS-Trans-BC-r16 ENUMERATED {n2} OPTIONAL,

interFreqDAPS-r16 SEQUENCE {

interFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL,

interFreqDiffSCS-DAPS-r16 ENUMERATED {supported} OPTIONAL,

interFreqMultiUL-TransmissionDAPS-r16 ENUMERATED {supported} OPTIONAL,

interFreqSemiStaticPowerSharingDAPS-Mode1-r16 ENUMERATED {supported} OPTIONAL,

interFreqSemiStaticPowerSharingDAPS-Mode2-r16 ENUMERATED {supported} OPTIONAL,

interFreqDynamicPowerSharingDAPS-r16 ENUMERATED {short, long} OPTIONAL,

interFreqUL-TransCancellationDAPS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

codebookParametersPerBC-r16 CodebookParameters-v1610 OPTIONAL,

-- R1 16-2a-10 Value of R for BD/CCE

blindDetectFactor-r16 INTEGER (1..2) OPTIONAL,

-- R1 11-2a: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured

-- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells

pdcch-MonitoringCA-r16 SEQUENCE {

maxNumberOfMonitoringCC-r16 INTEGER (2..16),

supportedSpanArrangement-r16 ENUMERATED {alignedOnly, alignedAndNonAligned}

} OPTIONAL,

-- R1 11-2c: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on

-- different carriers

pdcch-BlindDetectionCA-Mixed-r16 SEQUENCE {

pdcch-BlindDetectionCA1-r16 INTEGER (1..15),

pdcch-BlindDetectionCA2-r16 INTEGER (1..15),

supportedSpanArrangement-r16 ENUMERATED {alignedOnly, alignedAndNonAligned}

} OPTIONAL,

-- R1 11-2d: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span for MCG and for

-- SCG when configured for NR-DC operation with Rel-16 PDCCH monitoring capability on all the serving cells

pdcch-BlindDetectionMCG-UE-r16 INTEGER (1..14) OPTIONAL,

pdcch-BlindDetectionSCG-UE-r16 INTEGER (1..14) OPTIONAL,

-- R1 11-2e: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 16 and

-- Rel. 15 PDCCH monitoring capabilities on different carriers

pdcch-BlindDetectionMCG-UE-Mixed-r16 SEQUENCE {

pdcch-BlindDetectionMCG-UE1-r16 INTEGER (0..15),

pdcch-BlindDetectionMCG-UE2-r16 INTEGER (0..15)

} OPTIONAL,

pdcch-BlindDetectionSCG-UE-Mixed-r16 SEQUENCE {

pdcch-BlindDetectionSCG-UE1-r16 INTEGER (0..15),

pdcch-BlindDetectionSCG-UE2-r16 INTEGER (0..15)

} OPTIONAL,

-- R1 18-5 cross-carrier scheduling with different SCS in DL CA

crossCarrierSchedulingDL-DiffSCS-r16 ENUMERATED {low-to-high, high-to-low, both} OPTIONAL,

-- R1 18-5a Default QCL assumption for cross-carrier scheduling

crossCarrierSchedulingDefaultQCL-r16 ENUMERATED {diff-only, both} OPTIONAL,

-- R1 18-5b cross-carrier scheduling with different SCS in UL CA

crossCarrierSchedulingUL-DiffSCS-r16 ENUMERATED {low-to-high, high-to-low, both} OPTIONAL,

-- R1 13.19a Simultaneous positioning SRS and MIMO SRS transmission for a given BC

simul-SRS-MIMO-Trans-BC-r16 ENUMERATED {n2} OPTIONAL,

-- R1 16-3a, 16-3a-1, 16-3b, 16-3b-1: New Individual Codebook

codebookParametersAdditionPerBC-r16 CodebookParametersAdditionPerBC-r16 OPTIONAL,

-- R1 16-8: Mixed codebook

codebookComboParametersAdditionPerBC-r16 CodebookComboParametersAdditionPerBC-r16 OPTIONAL

}

CA-ParametersNR-v1630 ::= SEQUENCE {

-- R1 22-5b: Simultaneous transmission of SRS for antenna switching and SRS for CB/NCB /BM for inter-band UL CA

-- R1 22-5d: Simultaneous transmission of SRS for antenna switching for inter-band UL CA

simulTX-SRS-AntSwitchingInterBandUL-CA-r16 SimulSRS-ForAntennaSwitching-r16 OPTIONAL,

-- R4 8-5: supported beam management type for inter-band CA

beamManagementType-r16 ENUMERATED {ibm, cbm} OPTIONAL,

-- R4 7-3a: UL frequency separation class with aggregate BW and Gap BW

intraBandFreqSeparationUL-AggBW-GapBW-r16 ENUMERATED {classI, classII, classIII} OPTIONAL,

-- RAN 89: Case B in case of Inter-band CA with non-aligned frame boundaries

interCA-NonAlignedFrame-B-r16 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v16xy ::= SEQUENCE {

-- RAN 22-6: Support of up to 3 different numerologies in the same NR PUCCH group for NR part of EN-DC, NGEN-DC, NE-DC and NR-CA

-- where UE is not configured with two NR PUCCH groups

maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16 SEQUENCE {

fr1-NonSharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-SharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-NonSharedFDD-r16 ENUMERATED {supported} OPTIONAL,

fr2-r16 ENUMERATED {supported} OPTIONAL

}

-- RAN 22-6a: Support of up to 4 different numerologies in the same NR PUCCH group for NR part of EN-DC, NGEN-DC, NE-DC and NR-CA

-- where UE is not configured with two NR PUCCH groups

maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16 SEQUENCE {

fr1-NonSharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-SharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-NonSharedFDD-r16 ENUMERATED {supported} OPTIONAL,

fr2-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- RAN 22-7: Support two PUCCH groups for NR-CA with 3 or more bands with at least two carrier types

twoPUCCH-Grp-CarrierTypesList-r16 SEQUENCE (SIZE (1..maxCarrierTypesComb-r16)) OF TwoPUCCH-Grp-CarrierTypes-r16 OPTIONAL,

-- Alternative signalling of RAN 22-7:

-- RAN 22-7: Support two PUCCH groups for NR-CA with 3 or more bands with at least two carrier types

maxTwoPUCCH-Grp-ConfigList INTEGER ::= 16 or 8?

twoPUCCH-Grp-ConfigurationsList-r16 SEQUENCE (SIZE (1..maxTwoPUCCH-Grp-ConfigList)) OF

twoPUCCH-Grp-Configurations-r16

twoPUCCH-Grp-Configurations-r16 SEQUENCE {

pucch-PrimaryGroupMapping-r16 TwoPUCCH-Grp-ConfigParams-r16,

pucch-SecondaryGroupMapping-r16 TwoPUCCH-Grp-ConfigParams-r16

}

TwoPUCCH-Grp-ConfigParams-r16 ::= SEQUENCE {

pucch-GroupMapping-r16 TwoPUCCH-Grp-CarrierTypes-r16

pucch-TX-r16 TwoPUCCH-Grp-CarrierTypes-r16

}

TwoPUCCH-Grp-CarrierTypes-r16 ::= SEQUENCE {

fr1-NonSharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-SharedTDD-r16 ENUMERATED {supported} OPTIONAL,

fr1-NonSharedFDD-r16 ENUMERATED {supported} OPTIONAL,

fr2-r16 ENUMERATED {supported} OPTIONAL

}

-- R1 22-7a: Different numerology across NR PUCCH groups

diffNumerologyAcrossPUCCH-Group-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL,

-- R1 22-7b: Different numerologies across NR carriers within the same NR PUCCH group, with PUCCH on a carrier of smaller SCS

diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL,

-- R1 22-7c: Different numerologies across NR carriers within the same NR PUCCH group, with PUCCH on a carrier of larger SCS

diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL

-- R1 11-2f: add the replicated FGs of 11-2a/c with restriction for non-aligned span case

-- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells

pdcch-MonitoringCA-NonAlignedSpan-r16 INTEGER (2..16) OPTIONAL,

-- R1 11-2g: add the replicated FGs of 11-2a/c with restriction for non-aligned span case

pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16 SEQUENCE {

pdcch-BlindDetectionCA1-r16 INTEGER (1..15),

pdcch-BlindDetectionCA2-r16 INTEGER (1..15),

} OPTIONAL,

}

SimulSRS-ForAntennaSwitching-r16 ::= SEQUENCE {

supportSRS-xTyR-xLessThanY-r16 ENUMERATED {supported} OPTIONAL,

supportSRS-xTyR-xEqualToY-r16 ENUMERATED {supported} OPTIONAL,

supportSRS-AntennaSwitching-r16 ENUMERATED {supported} OPTIONAL

}

TwoPUCCH-Grp-CarrierTypes-r16 ::= SEQUENCE {

pucch-GroupMapping-r16 SEQUENCE {

fr1-NonSharedTDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr1-SharedTDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr1-NonSharedFDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr2-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL

}

pucch-TX-r16 SEQUENCE {

fr1-NonSharedTDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr1-SharedTDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr1-NonSharedFDD-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL,

fr2-r16 ENUMERATED {primaryPUCCH, secondaryPUCCH, both} OPTIONAL

}

}

-- TAG-CA-PARAMETERSNR-STOP

-- ASN1STOP

|  |
| --- |
| ***CA-ParametersNR* field description** |
| ***codebookParametersPerBC***  For a given supported band combination, this field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type, amongst the supported CSI-RS resources included in *codebookParametersPerBand* in *MIMO-ParametersPerBand*. |

– *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-v16xy ::= SEQUENCE {

ca-ParametersNR-ForDC-v16xy CA-ParametersNR-v16xy OPTIONAL

}

-- TAG-CA-PARAMETERS-NRDC-STOP

-- ASN1STOP

|  |
| --- |
| ***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 no version of this field (i.e., with and without suffix) is present for a band combination, the *ca-ParametersNR* field versions (with and without suffix) in *BandCombination* are applicable to the UE 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. |

*Next change*

– *FeatureSets*

The IE *FeatureSets* is used to provide pools of downlink and uplink features sets. A *FeatureSetCombination* refers to the IDs of the feature set(s) that the UE supports in that *FeatureSetCombination*. The *BandCombination* entries in the *BandCombinationList* then indicate the ID of the *FeatureSetCombination* that the UE supports for that band combination.

The entries in the lists in this IE are identified by their index position. For example, the *FeatureSetUplinkPerCC-Id* = 4 identifies the 4th element in the *featureSetsUplinkPerCC* list.

NOTE: When feature sets (per CC) IEs require extension in future versions of the specification, new versions of the *FeatureSetDownlink*, *FeatureSetUplink*, *FeatureSets*, *FeatureSetDownlinkPerCC* and/or *FeatureSetUplinkPerCC* will be created and instantiated in corresponding new lists in the *FeatureSets* IE. For example, if new capability bits are to be added to the *FeatureSetDownlink*, they will instead be defined in a new *FeatureSetDownlink-rxy* which will be instantiated in a new *featureSetDownlinkList-rxy* list. If a UE indicates in a *FeatureSetCombination* that it supports the *FeatureSetDownlink* with ID #5, it implies that it supports both the features in *FeatureSetDownlink* #5 and *FeatureSetDownlink-rxy* #5 (if present). The number of entries in the new list(s) shall be the same as in the original list(s).

***FeatureSets* information element**

-- ASN1START

-- TAG-FEATURESETS-START

FeatureSets ::= SEQUENCE {

featureSetsDownlink SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink OPTIONAL,

featureSetsDownlinkPerCC SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC OPTIONAL,

featureSetsUplink SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink OPTIONAL,

featureSetsUplinkPerCC SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC OPTIONAL,

...,

[[

featureSetsDownlink-v1540 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1540 OPTIONAL,

featureSetsUplink-v1540 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1540 OPTIONAL,

featureSetsUplinkPerCC-v1540 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC-v1540 OPTIONAL

]],

[[

featureSetsDownlink-v15a0 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v15a0 OPTIONAL

]],

[[

featureSetsDownlink-v1610 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1610 OPTIONAL,

featureSetsUplink-v1610 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1610 OPTIONAL,

featureSetDownlinkPerCC-v1620 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1620 OPTIONAL

]],

[[

featureSetsUplink-v1630 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1630 OPTIONAL

]],

[[

featureSetsUplink-v16xy SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v16xy OPTIONAL

]]

}

-- TAG-FEATURESETS-STOP

-- ASN1STOP

*Next change*

– *FeatureSetUplink*

The IE *FeatureSetUplink* is used to indicate the features that the UE supports on the carriers corresponding to one band entry in a band combination.

***FeatureSetUplink* information element**

-- ASN1START

-- TAG-FEATURESETUPLINK-START

FeatureSetUplink ::= SEQUENCE {

featureSetListPerUplinkCC SEQUENCE (SIZE (1.. maxNrofServingCells)) OF FeatureSetUplinkPerCC-Id,

scalingFactor ENUMERATED {f0p4, f0p75, f0p8} OPTIONAL,

dummy3 ENUMERATED {supported} OPTIONAL,

intraBandFreqSeparationUL FreqSeparationClass OPTIONAL,

searchSpaceSharingCA-UL ENUMERATED {supported} OPTIONAL,

dummy1 DummyI OPTIONAL,

supportedSRS-Resources SRS-Resources OPTIONAL,

twoPUCCH-Group ENUMERATED {supported} OPTIONAL,

dynamicSwitchSUL ENUMERATED {supported} OPTIONAL,

simultaneousTxSUL-NonSUL ENUMERATED {supported} OPTIONAL,

pusch-ProcessingType1-DifferentTB-PerSlot SEQUENCE {

scs-15kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

scs-30kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

scs-60kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

scs-120kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL

} OPTIONAL,

dummy2 DummyF OPTIONAL

}

FeatureSetUplink-v1540 ::= SEQUENCE {

zeroSlotOffsetAperiodicSRS ENUMERATED {supported} OPTIONAL,

pa-PhaseDiscontinuityImpacts ENUMERATED {supported} OPTIONAL,

pusch-SeparationWithGap ENUMERATED {supported} OPTIONAL,

pusch-ProcessingType2 SEQUENCE {

scs-15kHz ProcessingParameters OPTIONAL,

scs-30kHz ProcessingParameters OPTIONAL,

scs-60kHz ProcessingParameters OPTIONAL

} OPTIONAL,

ul-MCS-TableAlt-DynamicIndication ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v1610 ::= SEQUENCE {

-- R1 11-5: PUsCH repetition Type B

pusch-RepetitionTypeB-r16 SEQUENCE {

maxNumberPUSCH-Tx-r16 ENUMERATED {n2, n3, n4, n7, n8, n12},

hoppingScheme-r16 ENUMERATED {interSlotHopping, interRepetitionHopping, both}

} OPTIONAL,

-- R1 11-7: UL cancelation scheme for self-carrier

ul-CancellationSelfCarrier-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-7a: UL cancelation scheme for cross-carrier

ul-CancellationCrossCarrier-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-5c: The maximum number of SRS resources in one SRS resource set with usage set to 'codebook' for Mode 2

ul-FullPwrMode2-MaxSRS-ResInSet-r16 ENUMERATED {n1, n2, n4} OPTIONAL,

-- R1 22-4a/4b/4c/4d: CBG based transmission for UL with unicast PUSCH(s) per slot per CC with UE processing time Capability 1

cbgPUSCH-ProcessingType1-DifferentTB-PerSlot-r16 SEQUENCE {

scs-15kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-30kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-60kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-120kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL

} OPTIONAL,

-- R1 22-3a/3b/3c/3d: CBG based transmission for UL with unicast PUSCH(s) per slot per CC with UE processing time Capability 2

cbgPUSCH-ProcessingType2-DifferentTB-PerSlot-r16 SEQUENCE {

scs-15kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-30kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-60kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

scs-120kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL

} OPTIONAL,

supportedSRS-PosResources-r16 SRS-AllPosResources-r16 OPTIONAL,

intraFreqDAPS-UL-r16 SEQUENCE {

intraFreqMultiUL-TransmissionDAPS-r16 ENUMERATED {supported} OPTIONAL,

intraFreqTwoTAGs-DAPS-r16 ENUMERATED {supported} OPTIONAL,

dummy1 ENUMERATED {supported} OPTIONAL,

dummy2 ENUMERATED {supported} OPTIONAL,

dummy3 ENUMERATED {short, long} OPTIONAL

} OPTIONAL,

intraBandFreqSeparationUL-v1620 FreqSeparationClassUL-v1620 OPTIONAL,

-- R1 11-3: More than one PUCCH for HARQ-ACK transmission within a slot

multiPUCCH-r16 SEQUENCE {

sub-SlotConfig-NCP-r16 ENUMERATED {set1, set2} OPTIONAL,

sub-SlotConfig-ECP-r16 ENUMERATED {set1, set2} OPTIONAL

} OPTIONAL,

-- R1 11-3c: 2 PUCCH of format 0 or 2 for a single 7\*2-symbol subslot based HARQ-ACK codebook

twoPUCCH-Type1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-3d: 2 PUCCH of format 0 or 2 for a single 2\*7-symbol subslot based HARQ-ACK codebook

twoPUCCH-Type2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-3e: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for a single 2\*7-symbol HARQ-ACK codebooks

twoPUCCH-Type3-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-3f: 2 PUCCH transmissions in the same subslot for a single 2\*7-symbol HARQ-ACK codebooks which are not covered by 11-3d and

-- 11-3e

twoPUCCH-Type4-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-3g: SR/HARQ-ACK multiplexing once per subslot using a PUCCH (or HARQ-ACK piggybacked on a PUSCH) when SR/HARQ-ACK

-- are supposed to be sent with different starting symbols in a subslot

mux-SR-HARQ-ACK-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4: Two HARQ-ACK codebooks with up to one sub-slot based HARQ-ACK codebook (i.e. slot-based + slot-based, or slot-based +

-- sub-slot based) simultaneously constructed for supporting HARQ-ACK codebooks with different priorities at a UE

twoHARQ-ACK-Codebook-type1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4a: Two sub-slot based HARQ-ACK codebooks simultaneously constructed for supporting HARQ-ACK codebooks with different

-- priorities at a UE

twoHARQ-ACK-Codebook-type2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4c: 2 PUCCH of format 0 or 2 for two HARQ-ACK codebooks with one 7\*2-symbol sub-slot based HARQ-ACK codebook

twoPUCCH-Type5-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4d: 2 PUCCH of format 0 or 2 in consecutive symbols for two HARQ-ACK codebooks with one 2\*7-symbol sub-slot based HARQ-ACK

-- codebook

twoPUCCH-Type6-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4e: 2 PUCCH of format 0 or 2 for two subslot based HARQ-ACK codebooks

twoPUCCH-Type7-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4f: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for HARQ-ACK codebooks with one 2\*7-symbol

-- subslot based HARQ-ACK codebook

twoPUCCH-Type8-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4g: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for two subslot based HARQ-ACK codebooks

twoPUCCH-Type9-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4h: 2 PUCCH transmissions in the same subslot for two HARQ-ACK codebooks with one 2\*7-symbol subslot which are not covered

-- by 11-4c and 11-4e

twoPUCCH-Type10-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-4i: 2 PUCCH transmissions in the same subslot for two subslot based HARQ-ACK codebooks which are not covered by 11-4d and

-- 11-4f

twoPUCCH-Type11-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-1: UL intra-UE multiplexing/prioritization of overlapping channel/signals with two priority levels in physical layer

ul-IntraUE-Mux-r16 SEQUENCE {

pusch-PreparationLowPriority-r16 ENUMERATED {sym0, sym1, sym2},

pusch-PreparationHighPriority-r16 ENUMERATED {sym0, sym1, sym2}

} OPTIONAL,

-- R1 16-5a: Supported UL full power transmission mode of fullpower

ul-FullPwrMode-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-5d: Processing up to X unicast DCI scheduling for UL per scheduled CC

crossCarrierSchedulingProcessing-DiffSCS-r16 SEQUENCE {

scs-15kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

scs-15kHz-60kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

scs-30kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

scs-15kHz-30kHz-r16 ENUMERATED {n2} OPTIONAL,

scs-30kHz-60kHz-r16 ENUMERATED {n2} OPTIONAL,

scs-60kHz-120kHz-r16 ENUMERATED {n2} OPTIONAL

} OPTIONAL,

-- R1 16-5b: Supported UL full power transmission mode of fullpowerMode1

ul-FullPwrMode1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-5c-2: Ports configuration for Mode 2

ul-FullPwrMode2-SRSConfig-diffNumSRSPorts-r16 ENUMERATED {p1-2, p1-4, p1-2-4} OPTIONAL,

-- R1 16-5c-3: TPMI group for Mode 2

ul-FullPwrMode2-TPMIGroup-r16 SEQUENCE {

twoPorts-r16 BIT STRING(SIZE(2)) OPTIONAL,

fourPortsNonCoherent-r16 ENUMERATED{g0, g1, g2, g3} OPTIONAL,

fourPortsPartialCoherent-r16 ENUMERATED{g0, g1, g2, g3, g4, g5, g6} OPTIONAL

} OPTIONAL

}

FeatureSetUplink-v1630 ::= SEQUENCE {

-- R1 22-8: For SRS for CB PUSCH and antenna switching on FR1 with symbol level offset for aperiodic SRS transmission

offsetSRS-CB-PUSCH-Ant-Switch-fr1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 22-8a: PDCCH monitoring on any span of up to 3 consecutive OFDM symbols of a slot and constrained timeline for SRS for CB

-- PUSCH and antenna switching on FR1

offsetSRS-CB-PUSCH-PDCCH-MonitorSingleOcc-fr1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 22-8b: For type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS, monitoring occasion can be any OFDM symbol(s)

-- of a slot for Case 2 and constrained timeline for SRS for CB PUSCH and antenna switching on FR1

offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithoutGap-fr1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 22-8c: For type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS, monitoring occasion can be any OFDM symbol(s)

-- of a slot for Case 2 with a DCI gap and constrained timeline for SRS for CB PUSCH and antenna switching on FR1

offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithGap-fr1-r16 ENUMERATED {supported} OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

-- R1 22-9: Cancellation of PUCCH, PUSCH or PRACH with a DCI scheduling a PDSCH or CSI-RS or a DCI format 2\_0 for SFI

partialCancellationPUCCH-PUSCH-PRACH-TX-r16 ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v16xy ::= SEQUENCE {

-- R1 22-8d: All PDCCH monitoring occasion can be any OFDM symbol(s) of a slot for Case 2 with a span gap and constrained timeline

-- for SRS for CB PUSCH and antenna switching on FR1

offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithSpanGap-fr1-r16 SEQUENCE {

scs-15kHz ENUMERATED {set1, set2, set3} OPTIONAL,

scs-30kHz ENUMERATED {set1, set2, set3} OPTIONAL,

scs-60kHz ENUMERATED {set1, set2, set3} OPTIONAL

scs-120kHz ENUMERATED {set1, set2, set3} OPTIONAL

} OPTIONAL,

SRS-AllPosResources-r16 ::= SEQUENCE {

srs-PosResources-r16 SRS-PosResources-r16,

srs-PosResourceAP-r16 SRS-PosResourceAP-r16 OPTIONAL,

srs-PosResourceSP-r16 SRS-PosResourceSP-r16 OPTIONAL

}

SRS-PosResources-r16 ::= SEQUENCE {

maxNumberSRS-PosResourceSetPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n12, n16},

maxNumberSRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

maxNumberSRS-ResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14},

maxNumberPeriodicSRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

maxNumberPeriodicSRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

SRS-PosResourceAP-r16 ::= SEQUENCE {

maxNumberAP-SRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

maxNumberAP-SRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

SRS-PosResourceSP-r16 ::= SEQUENCE {

maxNumberSP-SRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

maxNumberSP-SRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

SRS-Resources ::= SEQUENCE {

maxNumberAperiodicSRS-PerBWP ENUMERATED {n1, n2, n4, n8, n16},

maxNumberAperiodicSRS-PerBWP-PerSlot INTEGER (1..6),

maxNumberPeriodicSRS-PerBWP ENUMERATED {n1, n2, n4, n8, n16},

maxNumberPeriodicSRS-PerBWP-PerSlot INTEGER (1..6),

maxNumberSemiPersistentSRS-PerBWP ENUMERATED {n1, n2, n4, n8, n16},

maxNumberSemiPersistentSRS-PerBWP-PerSlot INTEGER (1..6),

maxNumberSRS-Ports-PerResource ENUMERATED {n1, n2, n4}

}

DummyF ::= SEQUENCE {

maxNumberPeriodicCSI-ReportPerBWP INTEGER (1..4),

maxNumberAperiodicCSI-ReportPerBWP INTEGER (1..4),

maxNumberSemiPersistentCSI-ReportPerBWP INTEGER (0..4),

simultaneousCSI-ReportsAllCC INTEGER (5..32)

}

-- TAG-FEATURESETUPLINK-STOP

-- ASN1STOP

|  |
| --- |
| ***FeatureSetUplink* field descriptions** |
| ***featureSetListPerUplinkCC***  Indicates which features the UE supports on the individual UL carriers of the feature set (and hence of a band entry that refers to the feature set). The UE shall hence include at least as many *FeatureSetUplinkPerCC-Id* in this list as the number of carriers it supports according to the *ca-BandwidthClassUL*, except if indicating additional functionality by reducing the number of *FeatureSetUplinkPerCC-Id* in the feature set (see NOTE 1 in *FeatureSetCombination* IE description). The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the *FeatureSetUplinkPerCC-Id* in this list. |

*Next change*

– *MIMO-ParametersPerBand*

The IE *MIMO-ParametersPerBand* is used to convey MIMO related parameters specific for a certain band (not per feature set or band combination).

***MIMO-ParametersPerBand* information element**

-- ASN1START

-- TAG-MIMO-PARAMETERSPERBAND-START

MIMO-ParametersPerBand ::= SEQUENCE {

tci-StatePDSCH SEQUENCE {

maxNumberConfiguredTCIstatesPerCC ENUMERATED {n4, n8, n16, n32, n64, n128} OPTIONAL,

maxNumberActiveTCI-PerBWP ENUMERATED {n1, n2, n4, n8} OPTIONAL

} OPTIONAL,

additionalActiveTCI-StatePDCCH ENUMERATED {supported} OPTIONAL,

pusch-TransCoherence ENUMERATED {nonCoherent, partialCoherent, fullCoherent} OPTIONAL,

beamCorrespondenceWithoutUL-BeamSweeping ENUMERATED {supported} OPTIONAL,

periodicBeamReport ENUMERATED {supported} OPTIONAL,

aperiodicBeamReport ENUMERATED {supported} OPTIONAL,

sp-BeamReportPUCCH ENUMERATED {supported} OPTIONAL,

sp-BeamReportPUSCH ENUMERATED {supported} OPTIONAL,

dummy1 DummyG OPTIONAL,

maxNumberRxBeam INTEGER (2..8) OPTIONAL,

maxNumberRxTxBeamSwitchDL SEQUENCE {

scs-15kHz ENUMERATED {n4, n7, n14} OPTIONAL,

scs-30kHz ENUMERATED {n4, n7, n14} OPTIONAL,

scs-60kHz ENUMERATED {n4, n7, n14} OPTIONAL,

scs-120kHz ENUMERATED {n4, n7, n14} OPTIONAL,

scs-240kHz ENUMERATED {n4, n7, n14} OPTIONAL

} OPTIONAL,

maxNumberNonGroupBeamReporting ENUMERATED {n1, n2, n4} OPTIONAL,

groupBeamReporting ENUMERATED {supported} OPTIONAL,

uplinkBeamManagement SEQUENCE {

maxNumberSRS-ResourcePerSet-BM ENUMERATED {n2, n4, n8, n16},

maxNumberSRS-ResourceSet INTEGER (1..8)

} OPTIONAL,

maxNumberCSI-RS-BFD INTEGER (1..64) OPTIONAL,

maxNumberSSB-BFD INTEGER (1..64) OPTIONAL,

maxNumberCSI-RS-SSB-CBD INTEGER (1..256) OPTIONAL,

dummy2 ENUMERATED {supported} OPTIONAL,

twoPortsPTRS-UL ENUMERATED {supported} OPTIONAL,

dummy5 SRS-Resources OPTIONAL,

dummy3 INTEGER (1..4) OPTIONAL,

beamReportTiming SEQUENCE {

scs-15kHz ENUMERATED {sym2, sym4, sym8} OPTIONAL,

scs-30kHz ENUMERATED {sym4, sym8, sym14, sym28} OPTIONAL,

scs-60kHz ENUMERATED {sym8, sym14, sym28} OPTIONAL,

scs-120kHz ENUMERATED {sym14, sym28, sym56} OPTIONAL

} OPTIONAL,

ptrs-DensityRecommendationSetDL SEQUENCE {

scs-15kHz PTRS-DensityRecommendationDL OPTIONAL,

scs-30kHz PTRS-DensityRecommendationDL OPTIONAL,

scs-60kHz PTRS-DensityRecommendationDL OPTIONAL,

scs-120kHz PTRS-DensityRecommendationDL OPTIONAL

} OPTIONAL,

ptrs-DensityRecommendationSetUL SEQUENCE {

scs-15kHz PTRS-DensityRecommendationUL OPTIONAL,

scs-30kHz PTRS-DensityRecommendationUL OPTIONAL,

scs-60kHz PTRS-DensityRecommendationUL OPTIONAL,

scs-120kHz PTRS-DensityRecommendationUL OPTIONAL

} OPTIONAL,

dummy4 DummyH OPTIONAL,

aperiodicTRS ENUMERATED {supported} OPTIONAL,

...,

[[

dummy6 ENUMERATED {true} OPTIONAL,

beamManagementSSB-CSI-RS BeamManagementSSB-CSI-RS OPTIONAL,

beamSwitchTiming SEQUENCE {

scs-60kHz ENUMERATED {sym14, sym28, sym48, sym224, sym336} OPTIONAL,

scs-120kHz ENUMERATED {sym14, sym28, sym48, sym224, sym336} OPTIONAL

} OPTIONAL,

codebookParameters CodebookParameters OPTIONAL,

csi-RS-IM-ReceptionForFeedback CSI-RS-IM-ReceptionForFeedback OPTIONAL,

csi-RS-ProcFrameworkForSRS CSI-RS-ProcFrameworkForSRS OPTIONAL,

csi-ReportFramework CSI-ReportFramework OPTIONAL,

csi-RS-ForTracking CSI-RS-ForTracking OPTIONAL,

srs-AssocCSI-RS SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource OPTIONAL,

spatialRelations SpatialRelations OPTIONAL

]],

[[

-- R1 16-2b-0: Support of default QCL assumption with two TCI states

defaultQCL-TwoTCI-r16 ENUMERATED {supported} OPTIONAL,

codebookParametersPerBand-r16 CodebookParameters-v1610 OPTIONAL,

-- R1 16-1b-3: Support of PUCCH resource groups per BWP for simultaneous spatial relation update

simul-SpatialRelationUpdatePUCCHResGroup-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1f: Maximum number of SCells configured for SCell beam failure recovery simultaneously

maxNumberSCellBFR-r16 ENUMERATED {n1,n2,n4,n8} OPTIONAL,

-- R1 16-2c: Supports simultaneous reception with different Type-D for FR2 only

simultaneousReceptionDiffTypeD-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1a-1: SSB/CSI-RS for L1-SINR measurement

ssb-csirs-SINR-measurement-r16 SEQUENCE {

maxNumberSSB-CSIRS-OneTx-CMR-r16 ENUMERATED {n8, n16, n32, n64},

maxNumberCSI-IM-NZP-IMR-res-r16 ENUMERATED {n8, n16, n32, n64},

maxNumberCSIRS-2Tx-res-r16 ENUMERATED {n0, n4, n8, n16, n32, n64},

maxNumberSSB-CSIRS-res-r16 ENUMERATED {n8, n16, n32, n64, n128},

maxNumberCSI-IM-NZP-IMR-res-mem-r16 ENUMERATED {n8, n16, n32, n64, n128},

supportedCSI-RS-Density-CMR-r16 ENUMERATED {one, three, oneAndThree},

maxNumberAperiodicCSI-RS-Res-r16 ENUMERATED {n2, n4, n8, n16, n32, n64},

supportedSNIR-meas-r16 ENUMERATED {ssbWithCSI-IM, ssbWithNZP-IMR, csirsWithNZP-IMR, csi-RSWithoutIMR} OPTIONAL

} OPTIONAL,

-- R1 16-1a-2: Non-group based L1-SINR reporting

nonGroupSINR-reporting-r16 ENUMERATED {n1, n2, n4} OPTIONAL,

-- R1 16-1a-3: Non-group based L1-SINR reporting

groupSINR-reporting-r16 ENUMERATED {supported} OPTIONAL,

multiDCI-multiTRP-Parameters-r16 SEQUENCE {

-- R1 16-2a-0: Overlapping PDSCHs in time and fully overlapping in frequency and time

overlapPDSCHsFullyFreqTime-r16 INTEGER (1..2) OPTIONAL,

-- R1 16-2a-1: Overlapping PDSCHs in time and partially overlapping in frequency and time

overlapPDSCHsInTimePartiallyFreq-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2a-2: Out of order operation for DL

outOfOrderOperationDL-r16 SEQUENCE {

supportPDCCH-ToPDSCH-r16 ENUMERATED {supported} OPTIONAL,

supportPDSCH-ToHARQ-ACK-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- R1 16-2a-3: Out of order operation for UL

outOfOrderOperationUL-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2a-5: Separate CRS rate matching

separateCRS-RateMatching-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2a-6: Default QCL enhancement for multi-DCI based multi-TRP

defaultQCL-PerCORESETPoolIndex-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2a-7: Maximum number of activated TCI states

maxNumberActivatedTCI-States-r16 SEQUENCE {

maxNumberPerCORESET-Pool-r16 ENUMERATED {n1, n2, n4, n8},

maxTotalNumberAcrossCORESET-Pool-r16 ENUMERATED {n2, n4, n8, n16}

} OPTIONAL

} OPTIONAL,

singleDCI-SDM-scheme-Parameters-r16 SEQUENCE {

-- R1 16-2b-1b: Single-DCI based SDM scheme – Support of new DMRS port entry

supportNewDMRS-Port-r16 ENUMERATED {n0, n2, n3} OPTIONAL,

-- R1 16-2b-1a: Support of s-port DL PTRS

supportTwoPortDL-PTRS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- R1 16-2b-2: Support of single-DCI based FDMSchemeA

supportFDM-SchemeA-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2b-3a: Single-DCI based FDMSchemeB CW soft combining

supportCodeWordSoftCombining-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-2b-4: Single-DCI based TDMSchemeA

supportTDM-SchemeA-r16 ENUMERATED {kb3, kb5, kb10, kb20, noRestriction} OPTIONAL,

-- R1 16-2b-5: Single-DCI based inter-slot TDM

supportInter-slotTDM-r16 SEQUENCE {

supportRepNumPDSCH-TDRA-r16 ENUMERATED {n2, n3, n4, n5, n6, n7, n8, n16},

maxTBS-Size-r16 ENUMERATED {kb3, kb5, kb10, kb20, noRestriction},

maxNumberTCI-states-r16 INTEGER (1..2)

} OPTIONAL,

-- R1 16-4: Low PAPR DMRS for PDSCH

lowPAPR-DMRS-PDSCH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-6a: Low PAPR DMRS for PUSCH without transform precoding

lowPAPR-DMRS-PUSCHwithoutPrecoding-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-6b: Low PAPR DMRS for PUCCH

lowPAPR-DMRS-PUCCH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-6c: Low PAPR DMRS for PUSCH with transform precoding & pi/2 BPSK

lowPAPR-DMRS-PUSCHwithPrecoding-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-7: Extension of the maximum number of configured aperiodic CSI report settings

csi-ReportFrameworkExt-r16 CSI-ReportFrameworkExt-r16 OPTIONAL,

-- R1 16-3a, 16-3a-1, 16-3b, 16-3b-1, 16-8: Individual new codebook types

codebookParametersAddition-r16 CodebookParametersAddition-r16 OPTIONAL,

-- R1 16-8: Mixed codebook types

codebookComboParametersAddition-r16 CodebookComboParametersAddition-r16 OPTIONAL,

-- R4 8-2: SSB based beam correspondence

beamCorrespondenceSSB-based-r16 ENUMERATED {supported} OPTIONAL,

-- R4 8-3: CSI-RS based beam correspondence

beamCorrespondenceCSI-RS-based-r16 ENUMERATED {supported} OPTIONAL,

beamSwitchTiming-r16 SEQUENCE {

scs-60kHz-r16 ENUMERATED {sym224, sym336} OPTIONAL,

scs-120kHz-r16 ENUMERATED {sym224, sym336} OPTIONAL

} OPTIONAL

]],

[[

-- R1 16-1a-4: Semi-persistent L1-SINR report on PUCCH

semi-PersistentL1-SINR-Report-PUCCH-r16 SEQUENCE {

supportReportFormat1-2OFDM-syms-r16 ENUMERATED {supported} OPTIONAL,

supportReportFormat4-14OFDM-syms-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- R1 16-1a-5: Semi-persistent L1-SINR report on PUSCH

semi-PersistentL1-SINR-Report-PUSCH-r16 ENUMERATED {supported} OPTIONAL

]],

[[

-- R1 16-1h: Support of 64 configured PUCCH spatial relations

maxNumberConfiguredSpatialRelations-v16xy ENUMERATED {n96, n128, n160, n192, n224, n256, n288, n320} OPTIONAL,

-- R1 16-1i: Support of 64 configured candidate beam RSs for BFR

support64CandidateBeamRS-BFR-r16 ENUMERATED {supported} OPTIONAL

]]

}

DummyG ::= SEQUENCE {

maxNumberSSB-CSI-RS-ResourceOneTx ENUMERATED {n8, n16, n32, n64},

maxNumberSSB-CSI-RS-ResourceTwoTx ENUMERATED {n0, n4, n8, n16, n32, n64},

supportedCSI-RS-Density ENUMERATED {one, three, oneAndThree}

}

BeamManagementSSB-CSI-RS ::= SEQUENCE {

maxNumberSSB-CSI-RS-ResourceOneTx ENUMERATED {n0, n8, n16, n32, n64},

maxNumberCSI-RS-Resource ENUMERATED {n0, n4, n8, n16, n32, n64},

maxNumberCSI-RS-ResourceTwoTx ENUMERATED {n0, n4, n8, n16, n32, n64},

supportedCSI-RS-Density ENUMERATED {one, three, oneAndThree} OPTIONAL,

maxNumberAperiodicCSI-RS-Resource ENUMERATED {n0, n1, n4, n8, n16, n32, n64}

}

DummyH ::= SEQUENCE {

burstLength INTEGER (1..2),

maxSimultaneousResourceSetsPerCC INTEGER (1..8),

maxConfiguredResourceSetsPerCC INTEGER (1..64),

maxConfiguredResourceSetsAllCC INTEGER (1..128)

}

CSI-RS-ForTracking ::= SEQUENCE {

maxBurstLength INTEGER (1..2),

maxSimultaneousResourceSetsPerCC INTEGER (1..8),

maxConfiguredResourceSetsPerCC INTEGER (1..64),

maxConfiguredResourceSetsAllCC INTEGER (1..256)

}

CSI-RS-IM-ReceptionForFeedback ::= SEQUENCE {

maxConfigNumberNZP-CSI-RS-PerCC INTEGER (1..64),

maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC INTEGER (2..256),

maxConfigNumberCSI-IM-PerCC ENUMERATED {n1, n2, n4, n8, n16, n32},

maxNumberSimultaneousNZP-CSI-RS-PerCC INTEGER (1..64),

totalNumberPortsSimultaneousNZP-CSI-RS-PerCC INTEGER (2..256)

}

CSI-RS-ProcFrameworkForSRS ::= SEQUENCE {

maxNumberPeriodicSRS-AssocCSI-RS-PerBWP INTEGER (1..4),

maxNumberAperiodicSRS-AssocCSI-RS-PerBWP INTEGER (1..4),

maxNumberSP-SRS-AssocCSI-RS-PerBWP INTEGER (0..4),

simultaneousSRS-AssocCSI-RS-PerCC INTEGER (1..8)

}

CSI-ReportFramework ::= SEQUENCE {

maxNumberPeriodicCSI-PerBWP-ForCSI-Report INTEGER (1..4),

maxNumberAperiodicCSI-PerBWP-ForCSI-Report INTEGER (1..4),

maxNumberSemiPersistentCSI-PerBWP-ForCSI-Report INTEGER (0..4),

maxNumberPeriodicCSI-PerBWP-ForBeamReport INTEGER (1..4),

maxNumberAperiodicCSI-PerBWP-ForBeamReport INTEGER (1..4),

maxNumberAperiodicCSI-triggeringStatePerCC ENUMERATED {n3, n7, n15, n31, n63, n128},

maxNumberSemiPersistentCSI-PerBWP-ForBeamReport INTEGER (0..4),

simultaneousCSI-ReportsPerCC INTEGER (1..8)

}

CSI-ReportFrameworkExt-r16 ::= SEQUENCE {

maxNumberAperiodicCSI-PerBWP-ForCSI-ReportExt-r16 INTEGER (5..8)

}

PTRS-DensityRecommendationDL ::= SEQUENCE {

frequencyDensity1 INTEGER (1..276),

frequencyDensity2 INTEGER (1..276),

timeDensity1 INTEGER (0..29),

timeDensity2 INTEGER (0..29),

timeDensity3 INTEGER (0..29)

}

PTRS-DensityRecommendationUL ::= SEQUENCE {

frequencyDensity1 INTEGER (1..276),

frequencyDensity2 INTEGER (1..276),

timeDensity1 INTEGER (0..29),

timeDensity2 INTEGER (0..29),

timeDensity3 INTEGER (0..29),

sampleDensity1 INTEGER (1..276),

sampleDensity2 INTEGER (1..276),

sampleDensity3 INTEGER (1..276),

sampleDensity4 INTEGER (1..276),

sampleDensity5 INTEGER (1..276)

}

SpatialRelations ::= SEQUENCE {

maxNumberConfiguredSpatialRelations ENUMERATED {n4, n8, n16, n32, n64, n96},

maxNumberActiveSpatialRelations ENUMERATED {n1, n2, n4, n8, n14},

additionalActiveSpatialRelationPUCCH ENUMERATED {supported} OPTIONAL,

maxNumberDL-RS-QCL-TypeD ENUMERATED {n1, n2, n4, n8, n14}

}

DummyI ::= SEQUENCE {

supportedSRS-TxPortSwitch ENUMERATED {t1r2, t1r4, t2r4, t1r4-t2r4, tr-equal},

txSwitchImpactToRx ENUMERATED {true} OPTIONAL

}

-- TAG-MIMO-PARAMETERSPERBAND-STOP

-- ASN1STOP

|  |
| --- |
| ***MIMO-ParametersPerBand field description*** |
| ***codebookParametersPerBand***  For a given frequency band, this field this field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type. The supported CSI-RS resoureces indicated by this field are referred by *codebookParametersperBC* in *CA-ParametersNR* to indicate the supported CSI-RS resoruece per band combination. |
| ***csi-RS-IM-ReceptionForFeedback/ csi-RS-ProcFrameworkForSRS/ csi-ReportFramework***  CSI related capabilities which the UE supports on each of the carriers operated on this band. If the network configures the UE with serving cells on both FR1 and FR2 bands these values may be further limited by the corresponding fields in *fr1-fr2-Add-UE-NR-Capabilities*. |

*Next change*

#### – *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,

...,

[[

dummy ENUMERATED {supported} OPTIONAL

]],

[[

maxNumberSearchSpaces ENUMERATED {n10} OPTIONAL,

rateMatchingCtrlResrcSetDynamic ENUMERATED {supported} OPTIONAL,

maxLayersMIMO-Indication ENUMERATED {supported} OPTIONAL

]],

[[

spCellPlacement CarrierAggregationVariant OPTIONAL

]],

[[

-- R1 9-1: Basic channel structure and procedure of 2-step RACH

twoStepRACH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-1: Monitoring DCI format 1\_2 and DCI format 0\_2

dci-Format1-2And0-2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-1a: Monitoring both DCI format 0\_1/1\_1 and DCI format 0\_2/1\_2 in the same search space

monitoringDCI-SameSearchSpace-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-10: Type 2 configured grant release by DCI format 0\_1

type2-CG-ReleaseDCI-0-1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-11: Type 2 configured grant release by DCI format 0\_2

type2-CG-ReleaseDCI-0-2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-3: SPS release by DCI format 1\_1

sps-ReleaseDCI-1-1-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-3a: SPS release by DCI format 1\_2

sps-ReleaseDCI-1-2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 14-8: CSI trigger states containing non-active BWP

csi-TriggerStateNon-ActiveBWP-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-2: Support up to 4 SMTCs configured for an IAB node MT per frequency location, including IAB-specific SMTC window periodicities

seperateSMTC-InterIAB-Support-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-3: Support RACH configuration separately from the RACH configuration for UE access, including new IAB-specific offset and scaling factors

seperateRACH-IAB-Support-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-5a: Support semi-static configuration/indication of UL-Flexible-DL slot formats for IAB-MT resources

ul-flexibleDL-SlotFormatSemiStatic-IAB-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-5b: Support dynamic indication of UL-Flexible-DL slot formats for IAB-MT resources

ul-flexibleDL-SlotFormatDynamics-IAB-r16 ENUMERATED {supported} OPTIONAL,

dft-S-OFDM-WaveformUL-IAB-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-6: Support DCI Format 2\_5 based indication of soft resource availability to an IAB node

dci-25-AI-RNTI-Support-IAB-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-7: Support T\_delta reception.

t-DeltaReceptionSupport-IAB-r16 ENUMERATED {supported} OPTIONAL,

-- R1 20-8: Support of Desired guard symbol reporting and provided guard symbok reception.

guardSymbolReportReception-IAB-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-8 HARQ-ACK codebook type and spatial bundling per PUCCH group

harqACK-CB-SpatialBundlingPUCCH-Group-r16 ENUMERATED {supported} OPTIONAL,

-- R1 19-2: Cross Slot Scheduling

crossSlotScheduling-r16 SEQUENCE {

non-SharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL,

sharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

maxNumberSRS-PosPathLossEstimateAllServingCells-r16 ENUMERATED {n1, n4, n8, n16} OPTIONAL,

extendedCG-Periodicities-r16 ENUMERATED {supported} OPTIONAL,

extendedSPS-Periodicities-r16 ENUMERATED {supported} OPTIONAL,

codebookVariantsList-r16 CodebookVariantsList-r16 OPTIONAL,

-- R1 11-6: PUSCH repetition Type A

pusch-RepetitionTypeA-r16 SEQUENCE {

sharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL,

non-SharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- R1 11-4b: DL priority indication in DCI with mixed DCI formats

dci-DL-PriorityIndicator-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-1a: UL priority indication in DCI with mixed DCI formats

dci-UL-PriorityIndicator-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1e: Maximum number of configured pathloss reference RSs for PUSCH/PUCCH/SRS by RRC for MAC-CE based pathloss reference RS update

maxNumberPathlossRS-Update-r16 ENUMERATED {n4, n8, n16, n32, n64} OPTIONAL,

-- R1 18-9: Usage of the PDSCH starting time for HARQ-ACK type 2 codebook

type2-HARQ-ACK-Codebook-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1g-1: Resources for beam management, pathloss measurement, BFD, RLM and new beam identification across frequency ranges

maxTotalResourcesForAcrossFreqRanges-r16 SEQUENCE {

maxNumberResWithinSlotAcrossCC-AcrossFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n64, n128} OPTIONAL,

maxNumberResAcrossCC-AcrossFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n40, n48, n64, n72, n80, n96, n128, n256}

OPTIONAL

} OPTIONAL,

-- R1 16-2a-4: HARQ-ACK for multi-DCI based multi-TRP – separate

harqACK-separateMultiDCI-MultiTRP-r16 SEQUENCE {

maxNumberLongPUCCHs-r16 ENUMERATED {longAndLong, longAndShort, shortAndShort} OPTIONAL

} OPTIONAL,

-- R1 16-2a-4: HARQ-ACK for multi-DCI based multi-TRP – joint

harqACK-jointMultiDCI-MultiTRP-r16 ENUMERATED {supported} OPTIONAL,

-- R4 9-1: BWP switching on multiple CCs RRM requirements

bwp-SwitchingMultiCCs-r16 CHOICE {

type1-r16 ENUMERATED {us100, us200},

type2-r16 ENUMERATED {us200, us400, us800, us1000}

} OPTIONAL

]],

[[

targetSMTC-SCG-r16 ENUMERATED {supported} OPTIONAL,

supportRepetitionZeroOffsetRV-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-12: in-order CBG-based re-transmission

cbg-TransInOrderPUSCH-UL-r16 ENUMERATED {supported} OPTIONAL

]],

[[

-- R1 16-2a-8: Indicates that retransmission scheduled by a different CORESETPoolIndex for multi-DCI multi-TRP is not supported.

supportRetx-Diff-CoresetPool-Multi-DCI-TRP-r16 ENUMERATED {notSupported} OPTIONAL,

-- R1 22-10: Support of pdcch-MonitoringAnyOccasionsWithSpanGap in case of cross-carrier scheduling with different SCSs

pdcch-MonitoringAnyOccasionsWithSpanGapCrossCarrierSch-r16 ENUMERATED {interpretation2, interpretation3} 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,

...,

[[

dl-SchedulingOffset-PDSCH-TypeA ENUMERATED {supported} OPTIONAL,

dl-SchedulingOffset-PDSCH-TypeB ENUMERATED {supported} OPTIONAL,

ul-SchedulingOffset ENUMERATED {supported} OPTIONAL

]]

}

Phy-ParametersFRX-Diff ::= SEQUENCE {

dynamicSFI ENUMERATED {supported} OPTIONAL,

dummy1 BIT STRING (SIZE (2)) OPTIONAL,

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

dummy2 BIT STRING (SIZE (2)) OPTIONAL,

dummy3 BIT STRING (SIZE (2)) OPTIONAL,

supportedDMRS-TypeDL ENUMERATED {type1, type1And2} OPTIONAL,

supportedDMRS-TypeUL ENUMERATED {type1, type1And2} 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,

pucch-F0-2WithoutFH ENUMERATED {notSupported} OPTIONAL,

pucch-F1-3-4WithoutFH ENUMERATED {notSupported} OPTIONAL,

mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot 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 INTEGER (4..16) 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,

...,

[[

csi-RS-IM-ReceptionForFeedback CSI-RS-IM-ReceptionForFeedback OPTIONAL,

csi-RS-ProcFrameworkForSRS CSI-RS-ProcFrameworkForSRS OPTIONAL,

csi-ReportFramework CSI-ReportFramework OPTIONAL,

mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot SEQUENCE {

sameSymbol ENUMERATED {supported} OPTIONAL,

diffSymbol ENUMERATED {supported} OPTIONAL

} OPTIONAL,

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

mux-MultipleGroupCtrlCH-Overlap ENUMERATED {supported} OPTIONAL,

dl-SchedulingOffset-PDSCH-TypeA ENUMERATED {supported} OPTIONAL,

dl-SchedulingOffset-PDSCH-TypeB ENUMERATED {supported} OPTIONAL,

ul-SchedulingOffset ENUMERATED {supported} OPTIONAL,

dl-64QAM-MCS-TableAlt ENUMERATED {supported} OPTIONAL,

ul-64QAM-MCS-TableAlt ENUMERATED {supported} OPTIONAL,

cqi-TableAlt ENUMERATED {supported} OPTIONAL,

oneFL-DMRS-TwoAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL,

twoFL-DMRS-TwoAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL,

oneFL-DMRS-ThreeAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL

]],

[[

pdcch-BlindDetectionNRDC SEQUENCE {

pdcch-BlindDetectionMCG-UE INTEGER (1..15),

pdcch-BlindDetectionSCG-UE INTEGER (1..15)

} OPTIONAL,

mux-HARQ-ACK-PUSCH-DiffSymbol ENUMERATED {supported} OPTIONAL

]],

[[

-- R1 11-1b: Type 1 HARQ-ACK codebook support for relative TDRA for DL

type1-HARQ-ACK-Codebook-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-8: Enhanced UL power control scheme

enhancedPowerControl-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1b-1: TCI state activation across multiple CCs

simultaneousTCI-ActMultipleCC-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1b-2: Spatial relation update across multiple CCs

simultaneousSpatialRelationMultipleCC-r16 ENUMERATED {supported} OPTIONAL,

cli-RSSI-FDM-DL-r16 ENUMERATED {supported} OPTIONAL,

cli-SRS-RSRP-FDM-DL-r16 ENUMERATED {supported} OPTIONAL,

-- R1 19-3: Maximum MIMO Layer Adaptation

maxLayersMIMO-Adaptation-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-5: Configuration of aggregation factor per SPS configuration

aggregationFactorSPS-DL-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1g: Resources for beam management, pathloss measurement, BFD, RLM and new beam identification

maxTotalResourcesForOneFreqRange-r16 SEQUENCE {

maxNumberResWithinSlotAcrossCC-OneFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n64, n128} OPTIONAL,

maxNumberResAcrossCC-OneFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n40, n48, n64, n72, n80, n96, n128, n256}

OPTIONAL

} OPTIONAL,

-- R1 16-7: Extension of the maximum number of configured aperiodic CSI report settings

csi-ReportFrameworkExt-r16 CSI-ReportFrameworkExt-r16 OPTIONAL

]],

[[

twoTCI-Act-servingCellInCC-List-r16 ENUMERATED {supported} OPTIONAL

]]

}

Phy-ParametersFR1 ::= SEQUENCE {

pdcch-MonitoringSingleOccasion ENUMERATED {supported} OPTIONAL,

scs-60kHz ENUMERATED {supported} OPTIONAL,

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

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

...,

[[

pdsch-RE-MappingFR1-PerSlot ENUMERATED {n16, n32, n48, n64, n80, n96, n112, n128,

n144, n160, n176, n192, n208, n224, n240, n256} OPTIONAL

]]

}

Phy-ParametersFR2 ::= SEQUENCE {

dummy ENUMERATED {supported} OPTIONAL,

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

...,

[[

pCell-FR2 ENUMERATED {supported} OPTIONAL,

pdsch-RE-MappingFR2-PerSlot ENUMERATED {n16, n32, n48, n64, n80, n96, n112, n128,

n144, n160, n176, n192, n208, n224, n240, n256} OPTIONAL

]],

[[

-- R1 16-1c: Support of default spatial relation and pathloss reference RS for dedicated-PUCCH/SRS and PUSCH

defaultSpatialRelationPathlossRS-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-1d: Support of spatial relation update for AP-SRS via MAC CE

spatialRelationUpdateAP-SRS-r16 ENUMERATED {supported} OPTIONAL,

maxNumberSRS-PosSpatialRelationsAllServingCells-r16 ENUMERATED {n0, n1, n2, n4, n8, n16} OPTIONAL

]]

}

-- TAG-PHY-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| ***Phy-ParametersFRX-Diff field description*** |
| ***csi-RS-IM-ReceptionForFeedback/ csi-RS-ProcFrameworkForSRS/ csi-ReportFramework***  These fields are optionally present in *fr1-fr2-Add-UE-NR-Capabilities* in *UE-NR-Capability*. They shall not be set in any other instance of the IE *Phy-ParametersFRX-Diff*. If the network configures the UE with serving cells on both FR1 and FR2 bands, these parameters, if present, limit the corresponding parameters in *MIMO-ParametersPerBand*. |

#### – *Phy-ParametersSharedSpectrumChAccess*

The IE *Phy-ParametersSharedSpectrumChAccess* is used to convey the physical layer capabilities specific for shared spectrum channel access.

*Phy-ParametersSharedChAccess* information element

-- ASN1START

-- TAG-PHY-PARAMETERSSHAREDSPECTRUMCHACCESS-START

Phy-ParametersSharedChAccess-r16 ::= SEQUENCE {

-- 10-32 (1-2): SS block based SINR measurement (SS-SINR) for unlicensed spectrum

ss-SINR-Meas-r16 ENUMERATED {supported} OPTIONAL,

-- 10-33 (2-32a): Semi-persistent CSI report on PUCCH for unlicensed spectrum

sp-CSI-ReportPUCCH-r16 ENUMERATED {supported} OPTIONAL,

-- 10-33a (2-32b): Semi-persistent CSI report on PUSCH for unlicensed spectrum

sp-CSI-ReportPUSCH-r16 ENUMERATED {supported} OPTIONAL,

-- 10-34 (3-6): Dynamic SFI monitoring for unlicensed spectrum

dynamicSFI-r16 ENUMERATED {supported} OPTIONAL,

-- 10-35c (4-19c): SR/HARQ-ACK/CSI multiplexing once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when SR/HARQ-ACK/CSI are

-- supposed to be sent with different starting symbols in a slot for unlicensed spectrum

-- 10-35 (4-19): SR/HARQ-ACK/CSI multiplexing once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when SR/HARQ-ACK/CSI are

-- supposed to be sent with the same starting symbol on the PUCCH resources in a slot for unlicensed spectrum

mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot-r16 SEQUENCE {

sameSymbol-r16 ENUMERATED {supported} OPTIONAL,

diffSymbol-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

-- 10-35a (4-19a): Overlapping PUCCH resources have different starting symbols in a slot for unlicensed spectrum

mux-SR-HARQ-ACK-PUCCH-r16 ENUMERATED {supported} OPTIONAL,

-- 10-35b (4-19b): SR/HARQ-ACK/CSI multiplexing more than once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when SR/HARQ-

-- ACK/CSI are supposed to be sent with the same or different starting symbol in a slot for unlicensed spectrum

mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot-r16 ENUMERATED {supported} OPTIONAL,

-- 10-36 (4-28): HARQ-ACK multiplexing on PUSCH with different PUCCH/PUSCH starting OFDM symbols for unlicensed spectrum

mux-HARQ-ACK-PUSCH-DiffSymbol-r16 ENUMERATED {supported} OPTIONAL,

-- 10-37 (4-23): Repetitions for PUCCH format 1, 3, and 4 over multiple slots with K = 2, 4, 8 for unlicensed spectrum

pucch-Repetition-F1-3-4-r16 ENUMERATED {supported} OPTIONAL,

-- 10-38 (5-14): Type 1 configured PUSCH repetitions over multiple slots for unlicensed spectrum

type1-PUSCH-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

-- 10-39 (5-16): Type 2 configured PUSCH repetitions over multiple slots for unlicensed spectrum

type2-PUSCH-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

-- 10-40 (5-17): PUSCH repetitions over multiple slots for unlicensed spectrum

pusch-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

-- 10-40a (5-17a): PDSCH repetitions over multiple slots for unlicensed spectrum

pdsch-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

-- 10-41 (5-18): DL SPS

downlinkSPS-r16 ENUMERATED {supported} OPTIONAL,

-- 10-42 (5-19): Type 1 Configured UL grant

configuredUL-GrantType1-r16 ENUMERATED {supported} OPTIONAL,

-- 10-43 (5-20): Type 2 Configured UL grant

configuredUL-GrantType2-r16 ENUMERATED {supported} OPTIONAL,

-- 10-44 (5-21): Pre-emption indication for DL

pre-EmptIndication-DL-r16 ENUMERATED {supported} OPTIONAL

...

}

-- TAG-PHY-PARAMETERSSHAREDSPECTRUMCHACCESS-STOP

-- ASN1STOP

*Next change*

– *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,

...,

[[

supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL,

srs-SwitchingTimeRequested ENUMERATED {true} OPTIONAL

]],

[[

supportedBandCombinationList-v1550 BandCombinationList-v1550 OPTIONAL

]],

[[

supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL

]],

[[

supportedBandCombinationList-v1610 BandCombinationList-v1610 OPTIONAL,

supportedBandCombinationListSidelinkEUTRA-NR-r16 BandCombinationListSidelinkEUTRA-NR-r16 OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-r16 BandCombinationList-UplinkTxSwitch-r16 OPTIONAL

]],

[[

supportedBandCombinationList-v1630 BandCombinationList-v1630 OPTIONAL,

supportedBandCombinationListSidelinkEUTRA-NR-v1630 BandCombinationListSidelinkEUTRA-NR-v1630 OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-v1630 BandCombinationList-UplinkTxSwitch-v1630 OPTIONAL

]],

[[

supportedBandCombinationList-v16xy BandCombinationList-v16xy OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-v16xy BandCombinationList-UplinkTxSwitch-v16xy 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,

crossCarrierScheduling-SameSCS ENUMERATED {supported} OPTIONAL,

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

pusch-256QAM ENUMERATED {supported} OPTIONAL,

ue-PowerClass ENUMERATED {pc1, pc2, pc3, pc4} OPTIONAL,

rateMatchingLTE-CRS ENUMERATED {supported} OPTIONAL,

channelBWs-DL CHOICE {

fr1 SEQUENCE {

scs-15kHz BIT STRING (SIZE (10)) OPTIONAL,

scs-30kHz BIT STRING (SIZE (10)) OPTIONAL,

scs-60kHz BIT STRING (SIZE (10)) OPTIONAL

},

fr2 SEQUENCE {

scs-60kHz BIT STRING (SIZE (3)) OPTIONAL,

scs-120kHz BIT STRING (SIZE (3)) OPTIONAL

}

} OPTIONAL,

channelBWs-UL CHOICE {

fr1 SEQUENCE {

scs-15kHz BIT STRING (SIZE (10)) OPTIONAL,

scs-30kHz BIT STRING (SIZE (10)) OPTIONAL,

scs-60kHz BIT STRING (SIZE (10)) OPTIONAL

},

fr2 SEQUENCE {

scs-60kHz BIT STRING (SIZE (3)) OPTIONAL,

scs-120kHz BIT STRING (SIZE (3)) OPTIONAL

}

} OPTIONAL,

...,

[[

maxUplinkDutyCycle-PC2-FR1 ENUMERATED {n60, n70, n80, n90, n100} OPTIONAL

]],

[[

pucch-SpatialRelInfoMAC-CE ENUMERATED {supported} OPTIONAL,

powerBoosting-pi2BPSK ENUMERATED {supported} OPTIONAL

]],

[[

maxUplinkDutyCycle-FR2 ENUMERATED {n15, n20, n25, n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL

]],

[[

channelBWs-DL-v1590 CHOICE {

fr1 SEQUENCE {

scs-15kHz BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz BIT STRING (SIZE (16)) OPTIONAL

},

fr2 SEQUENCE {

scs-60kHz BIT STRING (SIZE (8)) OPTIONAL,

scs-120kHz BIT STRING (SIZE (8)) OPTIONAL

}

} OPTIONAL,

channelBWs-UL-v1590 CHOICE {

fr1 SEQUENCE {

scs-15kHz BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz BIT STRING (SIZE (16)) OPTIONAL

},

fr2 SEQUENCE {

scs-60kHz BIT STRING (SIZE (8)) OPTIONAL,

scs-120kHz BIT STRING (SIZE (8)) OPTIONAL

}

} OPTIONAL

]],

[[

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

]],

[[

-- R1 10: NR-unlicensed

sharedSpectrumChAccessParamsPerBand-r16 SharedSpectrumChAccessParamsPerBand-r16 OPTIONAL,

-- R1 11-7b: Independent cancellation of the overlapping PUSCHs in an intra-band UL CA

cancelOverlappingPUSCH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 14-1: Multiple LTE-CRS rate matching patterns

multipleRateMatchingEUTRA-CRS-r16 SEQUENCE {

maxNumberPatterns-r16 INTEGER (2..6),

maxNumberNon-OverlapPatterns-r16 INTEGER (1..3)

} OPTIONAL,

-- R1 14-1a: Two LTE-CRS overlapping rate matching patterns within a part of NR carrier using 15 kHz overlapping with a LTE carrier

overlapRateMatchingEUTRA-CRS-r16 ENUMERATED {supported} OPTIONAL,

-- R1 14-2: PDSCH Type B mapping of length 9 and 10 OFDM symbols

pdsch-MappingTypeB-Alt-r16 ENUMERATED {supported} OPTIONAL,

-- R1 14-3: One slot periodic TRS configuration for FR1

oneSlotPeriodicTRS-r16 ENUMERATED {supported} OPTIONAL,

olpc-SRS-Pos-r16 OLPC-SRS-Pos-r16 OPTIONAL,

spatialRelationsSRS-Pos-r16 SpatialRelationsSRS-Pos-r16 OPTIONAL,

simulSRS-MIMO-TransWithinBand-r16 ENUMERATED {n2} OPTIONAL,

channelBW-DL-IAB-r16 CHOICE {

fr1-100mhz SEQUENCE {

scs-15kHz ENUMERATED {supported} OPTIONAL,

scs-30kHz ENUMERATED {supported} OPTIONAL,

scs-60kHz ENUMERATED {supported} OPTIONAL

},

fr2-200mhz SEQUENCE {

scs-60kHz ENUMERATED {supported} OPTIONAL,

scs-120kHz ENUMERATED {supported} OPTIONAL

}

} OPTIONAL,

channelBW-UL-IAB-r16 CHOICE {

fr1-100mhz SEQUENCE {

scs-15kHz ENUMERATED {supported} OPTIONAL,

scs-30kHz ENUMERATED {supported} OPTIONAL,

scs-60kHz ENUMERATED {supported} OPTIONAL

},

fr2-200mhz SEQUENCE {

scs-60kHz ENUMERATED {supported} OPTIONAL,

scs-120kHz ENUMERATED {supported} OPTIONAL

}

} OPTIONAL,

rasterShift7dot5-IAB-r16 ENUMERATED {supported} OPTIONAL,

ue-PowerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

condHandover-r16 ENUMERATED {supported} OPTIONAL,

condHandoverFailure-r16 ENUMERATED {supported} OPTIONAL,

condHandoverTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

condPSCellChange-r16 ENUMERATED {supported} OPTIONAL,

condPSCellChangeTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

mpr-PowerBoost-FR2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 11-9: Multiple active configured grant configurations for a BWP of a serving cell

activeConfiguredGrant-r16 SEQUENCE {

maxNumberConfigsPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n12},

maxNumberConfigsAllCC-r16 INTEGER (2..32)

} OPTIONAL,

-- R1 11-9a: Joint release in a DCI for two or more configured grant Type 2 configurations for a given BWP of a serving cell

jointReleaseConfiguredGrantType2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 12-2: Multiple SPS configurations

sps-r16 SEQUENCE {

maxNumberConfigsPerBWP-r16 INTEGER (1..8),

maxNumberConfigsAllCC-r16 INTEGER (2..32)

} OPTIONAL,

-- R1 12-2a: Joint release in a DCI for two or more SPS configurations for a given BWP of a serving cell

jointReleaseSPS-r16 ENUMERATED {supported} OPTIONAL,

-- R1 13-19: Simultaneous positioning SRS and MIMO SRS transmission within a band across multiple CCs

simulSRS-TransWithinBand-r16 ENUMERATED {n2} OPTIONAL,

trs-AdditionalBandwidth-r16 ENUMERATED {trs-AddBW-Set1, trs-AddBW-Set2} OPTIONAL,

handoverIntraF-IAB-r16 ENUMERATED {supported} OPTIONAL

]],

[[

-- R1 22-5a: Simultaneous transmission of SRS for antenna switching and SRS for CB/NCB /BM for intra-band UL CA

-- R1 22-5c: Simultaneous transmission of SRS for antenna switching and SRS for antenna switching for intra-band UL CA

simulTX-SRS-AntSwitchingIntraBandUL-CA-r16 SimulSRS-ForAntennaSwitching-r16 OPTIONAL,

-- R1 10: NR-unlicensed

sharedSpectrumChAccessParamsPerBand-v1630 SharedSpectrumChAccessParamsPerBand-v1630 OPTIONAL

]],

[[

-- R4 7-4: Report the shorter transient capability supported by the UE: 2, 4 or 7us

enhancedUL-TransientPeriod-r16 ENUMERATED {us2, us4, us7} 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*. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |
| ***supportedBandCombinationList***  A list of band combinations that the UE supports for NR (and NR-DC, if requested). The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-NR-Capability* IE. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |
| ***supportedBandCombinationListSidelinkEUTRA-NR***  A list of band combinations that the UE supports for NR sidelink communication only, for joint NR sidelink communication and V2X sidelink communication, or for V2X sidelink communication only. The UE does not include this field if the UE capability is requested by E-UTRAN (see TS 36.331[10]) and the network request includes the field *eutra-nr-only*. |
| ***supportedBandCombinationList-UplinkTxSwitch***  A list of band combinations that the UE supports dynamic uplink Tx switching for NR UL CA and SUL. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-NR-Capability* IE. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |

– *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-v1590 BandCombinationList-v1590 OPTIONAL

]],

[[

supportedBandCombinationListNEDC-Only-v15a0 SEQUENCE {

supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL,

supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL,

supportedBandCombinationList-v1570 BandCombinationList-v1570 OPTIONAL,

supportedBandCombinationList-v1580 BandCombinationList-v1580 OPTIONAL,

supportedBandCombinationList-v1590 BandCombinationList-v1590 OPTIONAL

} OPTIONAL

]],

[[

supportedBandCombinationList-v1610 BandCombinationList-v1610 OPTIONAL,

supportedBandCombinationListNEDC-Only-v1610 BandCombinationList-v1610 OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-r16 BandCombinationList-UplinkTxSwitch-r16 OPTIONAL

]],

[[

supportedBandCombinationList-v1630 BandCombinationList-v1630 OPTIONAL,

supportedBandCombinationListNEDC-Only-v1630 BandCombinationList-v1630 OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-v1630 BandCombinationList-UplinkTxSwitch-v1630 OPTIONAL

]],

[[

supportedBandCombinationList-v16xy BandCombinationList-v16xy OPTIONAL,

supportedBandCombinationListNEDC-Only-v16xy BandCombinationList-v16xy OPTIONAL,

supportedBandCombinationList-UplinkTxSwitch-v16xy BandCombinationList-UplinkTxSwitch-v16xy OPTIONAL

]]

}

-- TAG-RF-PARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| ***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 (NG)EN-DC, or both (NG)EN-DC and NE-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |
| ***supportedBandCombinationListNEDC-Only, supportedBandCombinationListNEDC-Only-v1610***  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. |
| ***supportedBandCombinationList-UplinkTxSwitch***  A list of band combinations that the UE supports dynamic UL Tx switching for (NG)EN-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |

*Next change*

– *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [26].

***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,

measAndMobParameters MeasAndMobParameters 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 (CONTAINING UE-NR-Capability-v15c0) OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1530 OPTIONAL

}

-- Regular non-critical extensions:

UE-NR-Capability-v1530 ::= SEQUENCE {

fdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

tdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

interRAT-Parameters InterRAT-Parameters OPTIONAL,

inactiveState ENUMERATED {supported} OPTIONAL,

delayBudgetReporting ENUMERATED {supported} OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1540 OPTIONAL

}

UE-NR-Capability-v1540 ::= SEQUENCE {

sdap-Parameters SDAP-Parameters OPTIONAL,

overheatingInd ENUMERATED {supported} OPTIONAL,

ims-Parameters IMS-Parameters OPTIONAL,

fr1-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

fr2-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

fr1-fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1550 OPTIONAL

}

UE-NR-Capability-v1550 ::= SEQUENCE {

reducedCP-Latency ENUMERATED {supported} OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1560 OPTIONAL

}

UE-NR-Capability-v1560 ::= SEQUENCE {

nrdc-Parameters NRDC-Parameters OPTIONAL,

receivedFilters OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1570 OPTIONAL

}

UE-NR-Capability-v1570 ::= SEQUENCE {

nrdc-Parameters-v1570 NRDC-Parameters-v1570 OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1610 OPTIONAL

}

-- Late non-critical extensions:

UE-NR-Capability-v15c0 ::= SEQUENCE {

nrdc-Parameters-v15c0 NRDC-Parameters-v15c0 OPTIONAL,

partialFR2-FallbackRX-Req ENUMERATED {true} OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical extensions:

UE-NR-Capability-v1610 ::= SEQUENCE {

inDeviceCoexInd-r16 ENUMERATED {supported} OPTIONAL,

dl-DedicatedMessageSegmentation-r16 ENUMERATED {supported} OPTIONAL,

nrdc-Parameters-v1610 NRDC-Parameters-v1610 OPTIONAL,

powSav-Parameters-r16 PowSav-Parameters-r16 OPTIONAL,

fr1-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

fr2-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

bh-RLF-Indication-r16 ENUMERATED {supported} OPTIONAL,

directSN-AdditionFirstRRC-IAB-r16 ENUMERATED {supported} OPTIONAL,

bap-Parameters-r16 BAP-Parameters-r16 OPTIONAL,

referenceTimeProvision-r16 ENUMERATED {supported} OPTIONAL,

sidelinkParameters-r16 SidelinkParameters-r16 OPTIONAL,

highSpeedParameters-r16 HighSpeedParameters-r16 OPTIONAL,

mac-Parameters-v1610 MAC-Parameters-v1610 OPTIONAL,

mcgRLF-RecoveryViaSCG-r16 ENUMERATED {supported} OPTIONAL,

resumeWithStoredMCG-SCells-r16 ENUMERATED {supported} OPTIONAL,

resumeWithStoredSCG-r16 ENUMERATED {supported} OPTIONAL,

resumeWithSCG-Config-r16 ENUMERATED {supported} OPTIONAL,

ue-BasedPerfMeas-Parameters-r16 UE-BasedPerfMeas-Parameters-r16 OPTIONAL,

son-Parameters-r16 SON-Parameters-r16 OPTIONAL,

onDemandSIB-Connected-r16 ENUMERATED {supported} OPTIONAL,

nonCriticalExtension UE-NR-Capability-v16xy OPTIONAL

}

UE-NR-Capability-v16xy ::= SEQUENCE {

phy-ParametersSharedSpectrumChAccess-r16 Phy-ParametersSharedSpectrumChAccess-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

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

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

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

measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode-v1530 ::= SEQUENCE {

eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff

}

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

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

measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1540 ::= SEQUENCE {

ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1610 ::= SEQUENCE {

powSav-ParametersFRX-Diff-r16 PowSav-ParametersFRX-Diff-r16 OPTIONAL,

mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

BAP-Parameters-r16 ::= SEQUENCE {

flowControlBH-RLC-ChannelBased-r16 ENUMERATED {supported} OPTIONAL,

flowControlRouting-ID-Based-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

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

|  |
| --- |
| ***UE-NR-Capability-v1540 field descriptions*** |
| ***fr1-fr2-Add-UE-NR-Capabilities***  This instance of *UE-NR-CapabilityAddFRX-Mode* does not include any other fields than *csi-RS-IM-ReceptionForFeedback*/ *csi-RS-ProcFrameworkForSRS*/ *csi-ReportFramework*. |

*Next change*

– *SharedSpectrumChAccessParamsPerBand*

The IE *SharedSpectrumChAccessParamsPerBand* is used to convey shared channel access related parameters specific for a certain frequency band (not per feature set or band combination).

***SharedSpectrumChAccessParamsPerBand* information element**

-- ASN1START

-- TAG-SHAREDSPECTRUMCHACCESSPARAMSPERBAND-START

SharedSpectrumChAccessParamsPerBand-r16 ::= SEQUENCE {

-- R1 10-1: UL channel access for dynamic channel access mode

ul-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-1a: UL channel access for semi-static channel access mode

ul-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2: SSB-based RRM for dynamic channel access mode

ssb-RRM-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2a: SSB-based RRM for semi-static channel access mode

ssb-RRM-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2b: MIB reading on unlicensed cell

mib-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2c: SSB-based RLM for dynamic channel access mode

ssb-RLM-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2d: SSB-based RLM for semi-static channel access mode

ssb-RLM-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2e: SIB1 reception on unlicensed cell

sib1-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2f: Support monitoring of extended RAR window

extRA-ResponseWindow-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2g: SSB-based BFD/CBD for dynamic channel access mode

ssb-BFD-CBD-dynamicChannelAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2h: SSB-based BFD/CBD for semi-static channel access mode

ssb-BFD-CBD-semi-staticChannelAccess-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-2i: CSI-RS-based BFD/CBD for NR-U

csi-RS-BFD-CBD-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-7: UL channel access for 10 MHz SCell

ul-ChannelBW-SCell-10mhz-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-10: RSSI and channel occupancy measurement and reporting

rssi-ChannelOccupancyReporting-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-11:SRS starting position at any OFDM symbol in a slot

srs-StartAnyOFDM-Symbol-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-20: Support search space set configuration with freqMonitorLocation-r16

searchSpaceFreqMonitorLocation-r16 INTEGER (1..5) OPTIONAL,

-- R1 10-20a: Support coreset configuration with rb-Offset

coreset-RB-Offset-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-23:CGI reading on unlicensed cell for ANR functionality

cgi-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-25: Enable configured UL transmissions when DCI 2\_0 is configured but not detected

configuredUL-Tx-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-27: Wideband PRACH

prach-Wideband-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-29: Support available RB set indicator field in DCI 2\_0

dci-AvailableRB-Set-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-30: Support channel occupancy duration indicator field in DCI 2\_0

dci-ChOccupancyDuration-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-8: Type B PDSCH length {3, 5, 6, 8, 9, 10, 11, 12, 13} without DMRS shift due to CRS collision

typeB-PDSCH-length-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-9: Search space set group switching with explicit DCI 2\_0 bit field trigger or with implicit PDCCH decoding with DCI 2\_0 monitoring

searchSpaceSetGroupSwitchingwithDCI-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-9b: Search space set group switching with implicit PDCCH decoding without DCI 2\_0 monitoring FFS:per band or per UE

searchSpaceSetGroupSwitchingwithoutDCI-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-9d: Support Search space set group switching capability 2

searchSpaceSetGroupSwitchingcapability2-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-14: Non-numerical PDSCH to HARQ-ACK timing

non-numericalPDSCH-HARQ-timing-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-15: Enhanced dynamic HARQ codebook

enhancedDynamicHARQ-codebook-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-16: One-shot HARQ ACK feedback

oneShotHARQ-feedback-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-17: Multi-PUSCH UL grant

multiPUSCH-UL-grant-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-26: CSI-RS based RLM for NR-U

csi-RS-RLM-r16 ENUMERATED {supported} OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

-- R1 10-31: Support of P/SP-CSI-RS reception with CSI-RS-ValidationWith-DCI-r16 configured

periodicAndSemi-PersistentCSI-RS-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-3: PRB interlace mapping for PUSCH

pusch-PRB-interlace-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-3a: PRB interlace mapping for PUCCH

pucch-F0-F1-PRB-Interlace-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-12: OCC for PRB interlace mapping for PF2 and PF3

occ-PRB-PF2-PF3-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-13a: Extended CP range of more than one symbol for CG-PUSCH

extCP-rangeCG-PUSCH-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-18: Configured grant with retransmission in CG resources

configuredGrantWithReTx-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-21a: Support using ED threshold given by gNB for UL to DL COT sharing

ed-Threshold-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-21b: Support UL to DL COT sharing

ul-DL-COT-Sharing-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-24: CG-UCI multiplexing with HARQ ACK

mux-CG-UCI-HARQ-ACK-r16 ENUMERATED {supported} OPTIONAL,

-- R1 10-28: Configured grant with Rel-16 enhanced resource configuration

cg-resourceConfig-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v1630 ::= SEQUENCE {

-- R4 4-1: DL reception in intra-carrier guardband

dl-ReceptionIntraCellGuardband-r16 ENUMERATED {supported} OPTIONAL,

-- R4 4-2: DL reception when gNB does not transmit on all RB sets of a carrier as a result of LBT

dl-ReceptionLBT-subsetRB-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v16xy ::= SEQUENCE {

-- 10-26b(1-4): CSI-RS based RRM measurement with associated SS-block

csi-RSRP-AndRSRQ-MeasWithSSB-r16 ENUMERATED {supported} OPTIONAL,

-- 10-26c(1-5): CSI-RS based RRM measurement without associated SS-block

csi-RSRP-AndRSRQ-MeasWithoutSSB-r16 ENUMERATED {supported} OPTIONAL,

-- 10-26d(1-6): CSI-RS based RS-SINR measurement

csi-SINR-Meas-r16 ENUMERATED {supported} OPTIONAL,

-- 10-26e(1-8): RLM based on a mix of SS block and CSI-RS signals within active BWP

ssb-AndCSI-RS-RLM-r16 ENUMERATED {supported} OPTIONAL,

-- 10-26f(1-9): CSI-RS based contention free RA for HO

csi-RS-CFRA-ForHO-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-SHAREDSPECTRUMCHACCESSPARAMSPERBAND-STOP

-- ASN1STOP

*Next change*

6.4 RRC multiplicity and type constraint values

– Multiplicity and type constraint definitions

-- ASN1START

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

maxAI-DCI-PayloadSize-r16 INTEGER ::= 128 --Maximum size of the DCI payload scrambled with ai-RNTI

maxAI-DCI-PayloadSize-r16-1 INTEGER ::= 127 --Maximum size of the DCI payload scrambled with ai-RNTI minus 1

maxBandComb INTEGER ::= 65536 -- Maximum number of DL band combinations

maxBandsUTRA-FDD-r16 INTEGER ::= 64 -- Maximum number of bands listed in UTRA-FDD UE caps

maxBH-RLC-ChannelID-r16 INTEGER ::= 65536 -- Maximum value of BH RLC Channel ID

maxBT-IdReport-r16 INTEGER ::= 32 -- Maximum number of Bluetooth IDs to report

maxBT-Name-r16 INTEGER ::= 4 -- Maximum number of Bluetooth name

maxCAG-Cell-r16 INTEGER ::= 16 -- Maximum number of NR CAG cell ranges in SIB3, SIB4

maxCarrierTypes-r16 INTEGER ::= 16 -- Maximum number of supported configuration(s) of {primary PUCCH group config,

-- secondary PUCCH group config}

maxCBR-Config-r16 INTEGER ::= 8 -- Maximum number of CBR range configurations for sidelink communication

-- congestion control

maxCBR-Config-1-r16 INTEGER ::= 7 -- Maximum number of CBR range configurations for sidelink communication

-- congestion control minus 1

maxCBR-Level-r16 INTEGER ::= 16 -- Maximum nuber of CBR levels

maxCBR-Level-1-r16 INTEGER ::= 15 -- Maximum number of CBR levels minus 1

maxCellBlack INTEGER ::= 16 -- Maximum number of NR blacklisted cell ranges in SIB3, SIB4

maxCellHistory-r16 INTEGER ::= 16 -- Maximum number of visited cells reported

maxCellInter INTEGER ::= 16 -- Maximum number of inter-Freq cells listed in SIB4

maxCellIntra INTEGER ::= 16 -- Maximum number of intra-Freq cells listed in SIB3

maxCellMeasEUTRA INTEGER ::= 32 -- Maximum number of cells in E-UTRAN

maxCellMeasIdle-r16 INTEGER ::= 8 -- Maximum number of cells per carrier for idle/inactive measurements

maxCellMeasUTRA-FDD-r16 INTEGER ::= 32 -- Maximum number of cells in FDD UTRAN

maxCellWhite INTEGER ::= 16 -- Maximum number of NR whitelisted cell ranges in SIB3, SIB4

maxEARFCN INTEGER ::= 262143 -- Maximum value of E-UTRA carrier frequency

maxEUTRA-CellBlack INTEGER ::= 16 -- Maximum number of E-UTRA blacklisted physical cell identity ranges

-- in SIB5

maxEUTRA-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxLogMeasReport-r16 INTEGER ::= 520 -- Maximum number of entries for logged measurements

maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands that a cell belongs to

maxNARFCN INTEGER ::= 3279165 -- Maximum value of NR carrier frequency

maxNR-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFreqIdle-r16 INTEGER ::= 8 -- Maximum number of carrier frequencies for idle/inactive measurements

maxNrofServingCells INTEGER ::= 32 -- Max number of serving cells (SpCells + SCells)

maxNrofServingCells-1 INTEGER ::= 31 -- Max number of serving cells (SpCell + SCells) per cell group

maxNrofAggregatedCellsPerCellGroup INTEGER ::= 16

maxNrofDUCells-r16 INTEGER ::= 512 -- Max number of cells configured on the collocated IAB-DU

maxNrofAssociatedDUCellsPerMT-r16 INTEGER ::= 65535

maxNrofAvailabilityCombinationsPerSet-r16 INTEGER ::= 512 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5

maxNrofAvailabilityCombinationsPerSet-r16-1 INTEGER ::= 511 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5 minus 1

maxNrofSCells INTEGER ::= 31 -- Max number of secondary serving cells per cell group

maxNrofCellMeas INTEGER ::= 32 -- Maximum number of entries in each of the cell lists in a measurement object

maxNrofCG-SL-r16 INTEGER ::= 8 -- Max number of sidelink configured grant

maxNrofCG-SL-r16-1 INTEGER ::= 7 -- Max number of sidelink configured grant minus 1

maxNrofSS-BlocksToAverage INTEGER ::= 16 -- Max number for the (max) number of SS blocks to average to determine cell measurement

maxNrofCondCells-r16 INTEGER ::= 8 -- Max number of conditional candidate SpCells

maxNrofCSI-RS-ResourcesToAverage INTEGER ::= 16 -- Max number for the (max) number of CSI-RS to average to determine cell measurement

maxNrofDL-Allocations INTEGER ::= 16 -- Maximum number of PDSCH time domain resource allocations

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

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

maxLC-ID INTEGER ::= 32 -- Maximum value of Logical Channel ID

maxLC-ID-Iab-r16 INTEGER ::= 65855 -- Maximum value of BH Logical Channel ID extension

maxLTE-CRS-Patterns-r16 INTEGER ::= 3 -- Maximum number of additional LTE CRS rate matching patterns

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

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

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

maxNrofCombIDC INTEGER ::= 128 -- Maximum number of reported MR-DC combinations for IDC

maxNrofSymbols-1 INTEGER ::= 13 -- Maximum index identifying a symbol within a slot (14 symbols, indexed from 0..13)

maxNrofSlots INTEGER ::= 320 -- Maximum number of slots in a 10 ms period

maxNrofSlots-1 INTEGER ::= 319 -- Maximum number of slots in a 10 ms period minus 1

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

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

maxNrofPhysicalResourceBlocksPlus1 INTEGER ::= 276 -- Maximum number of PRBs plus 1

maxNrofControlResourceSets INTEGER ::= 12 -- Max number of CoReSets configurable on a serving cell

maxNrofControlResourceSets-1 INTEGER ::= 11 -- Max number of CoReSets configurable on a serving cell minus 1

maxNrofControlResourceSets-1-r16 INTEGER ::= 15 -- Max number of CoReSets configurable on a serving cell extended in minus 1

maxNrofCoresetPools-r16 INTEGER ::= 2 -- Maximum number of CORESET pools

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

maxNrofSearchSpaces-1 INTEGER ::= 39 -- Max number of Search Spaces minus 1

maxSFI-DCI-PayloadSize INTEGER ::= 128 -- Max number payload of a DCI scrambled with SFI-RNTI

maxSFI-DCI-PayloadSize-1 INTEGER ::= 127 -- Max number payload of a DCI scrambled with SFI-RNTI minus 1

maxIAB-IP-Address-r16 INTEGER ::= 32 -- Max number of assigned IP addresses

maxINT-DCI-PayloadSize INTEGER ::= 126 -- Max number payload of a DCI scrambled with INT-RNTI

maxINT-DCI-PayloadSize-1 INTEGER ::= 125 -- Max number payload of a DCI scrambled with INT-RNTI minus 1

maxNrofRateMatchPatterns INTEGER ::= 4 -- Max number of rate matching patterns that may be configured

maxNrofRateMatchPatterns-1 INTEGER ::= 3 -- Max number of rate matching patterns that may be configured minus 1

maxNrofRateMatchPatternsPerGroup INTEGER ::= 8 -- Max number of rate matching patterns that may be configured in one group

maxNrofCSI-ReportConfigurations INTEGER ::= 48 -- Maximum number of report configurations

maxNrofCSI-ReportConfigurations-1 INTEGER ::= 47 -- Maximum number of report configurations minus 1

maxNrofCSI-ResourceConfigurations INTEGER ::= 112 -- Maximum number of resource configurations

maxNrofCSI-ResourceConfigurations-1 INTEGER ::= 111 -- Maximum number of resource configurations minus 1

maxNrofAP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrOfCSI-AperiodicTriggers INTEGER ::= 128 -- Maximum number of triggers for aperiodic CSI reporting

maxNrofReportConfigPerAperiodicTrigger INTEGER ::= 16 -- Maximum number of report configurations per trigger state for aperiodic reporting

maxNrofNZP-CSI-RS-Resources INTEGER ::= 192 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources

maxNrofNZP-CSI-RS-Resources-1 INTEGER ::= 191 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources minus 1

maxNrofNZP-CSI-RS-ResourcesPerSet INTEGER ::= 64 -- Maximum number of NZP CSI-RS resources per resource set

maxNrofNZP-CSI-RS-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-RS resources per cell

maxNrofNZP-CSI-RS-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resources per cell minus 1

maxNrofNZP-CSI-RS-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of resource sets per resource configuration

maxNrofNZP-CSI-RS-ResourcesPerConfig INTEGER ::= 128 -- Maximum number of resources per resource configuration

maxNrofZP-CSI-RS-Resources INTEGER ::= 32 -- Maximum number of Zero-Power (ZP) CSI-RS resources

maxNrofZP-CSI-RS-Resources-1 INTEGER ::= 31 -- Maximum number of Zero-Power (ZP) CSI-RS resources minus 1

maxNrofZP-CSI-RS-ResourceSets-1 INTEGER ::= 15

maxNrofZP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrofZP-CSI-RS-ResourceSets INTEGER ::= 16

maxNrofCSI-IM-Resources INTEGER ::= 32 -- Maximum number of CSI-IM resources. See CSI-IM-ResourceMax in 38.214.

maxNrofCSI-IM-Resources-1 INTEGER ::= 31 -- Maximum number of CSI-IM resources minus 1. See CSI-IM-ResourceMax in 38.214.

maxNrofCSI-IM-ResourcesPerSet INTEGER ::= 8 -- Maximum number of CSI-IM resources per set. See CSI-IM-ResourcePerSetMax in 38.214

maxNrofCSI-IM-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-IM resources per cell

maxNrofCSI-IM-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-IM resources per cell minus 1

maxNrofCSI-IM-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of CSI IM resource sets per resource configuration

maxNrofCSI-SSB-ResourcePerSet INTEGER ::= 64 -- Maximum number of SSB resources in a resource set

maxNrofCSI-SSB-ResourceSets INTEGER ::= 64 -- Maximum number of CSI SSB resource sets per cell

maxNrofCSI-SSB-ResourceSets-1 INTEGER ::= 63 -- Maximum number of CSI SSB resource sets per cell minus 1

maxNrofCSI-SSB-ResourceSetsPerConfig INTEGER ::= 1 -- Maximum number of CSI SSB resource sets per resource configuration

maxNrofFailureDetectionResources INTEGER ::= 10 -- Maximum number of failure detection resources

maxNrofFailureDetectionResources-1 INTEGER ::= 9 -- Maximum number of failure detection resources minus 1

maxNrofFreqSL-r16 INTEGER ::= 8 -- Maximum number of carrier frequncy for for NR sidelink communication

maxNrofSL-BWPs-r16 INTEGER ::= 4 -- Maximum number of BWP for for NR sidelink communication

maxFreqSL-EUTRA-r16 INTEGER ::= 8 -- Maximum number of EUTRA anchor carrier frequncy for NR sidelink communication

maxNrofSL-MeasId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement identity (RSRP) per destination

maxNrofSL-ObjectId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement objects (RSRP) per destination

maxNrofSL-ReportConfigId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement reporting configuration(RSRP) per destination

maxNrofSL-PoolToMeasureNR-r16 INTEGER ::= 8 -- Maximum number of resoure pool for NR sidelink measurement to measure for

-- each measurement object (for CBR)

maxFreqSL-NR-r16 INTEGER ::= 8 -- Maximum number of NR anchor carrier frequncy for NR sidelink communication

maxNrofSL-QFIs-r16 INTEGER ::= 2048 -- Maximum number of QoS flow for NR sidelink communication per UE

maxNrofSL-QFIsPerDest-r16 INTEGER ::= 64 -- Maximum number of QoS flow per destination for NR sidelink communication

maxNrofObjectId INTEGER ::= 64 -- Maximum number of measurement objects

maxNrofPageRec INTEGER ::= 32 -- Maximum number of page records

maxNrofPCI-Ranges INTEGER ::= 8 -- Maximum number of PCI ranges

maxPLMN INTEGER ::= 12 -- Maximum number of PLMNs broadcast and reported by UE at establisghment

maxNrofCSI-RS-ResourcesRRM INTEGER ::= 96 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= 95 -- Maximum number of CSI-RS resources per cell for an RRM measurement object minus 1

maxNrofMeasId INTEGER ::= 64 -- Maximum number of configured measurements

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

maxNrofCSI-RS-CellsRRM INTEGER ::= 96 -- Maximum number of cells with CSI-RS resources for an RRM measurement object

maxNrofSL-Dest-r16 INTEGER ::= 32 -- Maximum number of destination for NR sidelink communication

maxNrofSL-Dest-1-r16 INTEGER ::= 31 -- Highest index of destination for NR sidelink communication

maxNrofSLRB-r16 INTEGER ::= 512 -- Maximum number of radio bearer for NR sidelink communication per UE

maxSL-LCID-r16 INTEGER ::= 512 -- Maximum number of RLC bearer for NR sidelink communication per UE

maxSL-SyncConfig-r16 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

maxNrofRXPool-r16 INTEGER ::= 16 -- Maximum number of Rx resource poolfor NR sidelink communication

maxNrofTXPool-r16 INTEGER ::= 8 -- Maximum number of Tx resourcepoolfor NR sidelink communication

maxNrofPoolID-r16 INTEGER ::= 16 -- Maximum index of resource pool for NR sidelink communication

maxNrofSRS-PathlossReferenceRS-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for SRS power control.

maxNrofSRS-PathlossReferenceRS-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for SRS power control-1.

maxNrofSRS-ResourceSets INTEGER ::= 16 -- Maximum number of SRS resource sets in a BWP.

maxNrofSRS-ResourceSets-1 INTEGER ::= 15 -- Maximum number of SRS resource sets in a BWP minus 1.

maxNrofSRS-PosResourceSets-r16 INTEGER ::= 16 -- Maximum number of SRS Positioning resource sets in a BWP.

maxNrofSRS-PosResourceSets-1-r16 INTEGER ::= 15 -- Maximum number of SRS Positioning resource sets in a BWP minus 1.

maxNrofSRS-Resources INTEGER ::= 64 -- Maximum number of SRS resources.

maxNrofSRS-Resources-1 INTEGER ::= 63 -- Maximum number of SRS resources minus 1.

maxNrofSRS-PosResources-r16 INTEGER ::= 64 -- Maximum number of SRS Positioning resources.

maxNrofSRS-PosResources-1-r16 INTEGER ::= 63 -- Maximum number of SRS Positioning resources in an SRS Positioning

-- resource set minus 1.

maxNrofSRS-ResourcesPerSet INTEGER ::= 16 -- Maximum number of SRS resources in an SRS resource set

maxNrofSRS-TriggerStates-1 INTEGER ::= 3 -- Maximum number of SRS trigger states minus 1, i.e., the largest code point.

maxNrofSRS-TriggerStates-2 INTEGER ::= 2 -- Maximum number of SRS trigger states minus 2.

maxRAT-CapabilityContainers INTEGER ::= 8 -- Maximum number of interworking RAT containers (incl NR and MRDC)

maxSimultaneousBands INTEGER ::= 32 -- Maximum number of simultaneously aggregated bands

maxULTxSwitchingBandPairs INTEGER ::= 32 -- Maximum number of band pairs supporting dynamic UL Tx switching in a band combination

maxNrofSlotFormatCombinationsPerSet INTEGER ::= 512 -- Maximum number of Slot Format Combinations in a SF-Set.

maxNrofSlotFormatCombinationsPerSet-1 INTEGER ::= 511 -- Maximum number of Slot Format Combinations in a SF-Set minus 1.

maxNrofTrafficPattern-r16 INTEGER ::= 8 -- Maximum number of Traffic Pattern for NR sidelink communication.

maxNrofPUCCH-Resources INTEGER ::= 128

maxNrofPUCCH-Resources-1 INTEGER ::= 127

maxNrofPUCCH-ResourceSets INTEGER ::= 4 -- Maximum number of PUCCH Resource Sets

maxNrofPUCCH-ResourceSets-1 INTEGER ::= 3 -- Maximum number of PUCCH Resource Sets minus 1.

maxNrofPUCCH-ResourcesPerSet INTEGER ::= 32 -- Maximum number of PUCCH Resources per PUCCH-ResourceSet

maxNrofPUCCH-P0-PerSet INTEGER ::= 8 -- Maximum number of P0-pucch present in a p0-pucch set

maxNrofPUCCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUCCH power control.

maxNrofPUCCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUCCH power control minus 1.

maxNrofPUCCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUCCH power control extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUCCH power control

-- minus 1 extended.

maxNrofPUCCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between the extended maximum and the non-extended maximum

maxNrofPUCCH-ResourceGroups-r16 INTEGER ::= 4 -- Maximum number of PUCCH resources groups.

maxNrofPUCCH-ResourcesPerGroup-r16 INTEGER ::= 128 -- Maximum number of PUCCH resources in a PUCCH group.

maxNrofMultiplePUSCHs-r16 INTEGER ::= 8 -- Maximum number of multiple PUSCHs in PUSCH TDRA list

maxNrofP0-PUSCH-AlphaSets INTEGER ::= 30 -- Maximum number of P0-pusch-alpha-sets (see 38,213, clause 7.1)

maxNrofP0-PUSCH-AlphaSets-1 INTEGER ::= 29 -- Maximum number of P0-pusch-alpha-sets minus 1 (see 38,213, clause 7.1)

maxNrofPUSCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUSCH power control.

maxNrofPUSCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUSCH power control minus 1.

maxNrofPUSCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH power control extended

maxNrofPUSCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH power control minus 1

maxNrofPUSCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between maxNrofPUSCH-PathlossReferenceRSs-r16 and

-- maxNrofPUSCH-PathlossReferenceRSs

maxNrofNAICS-Entries INTEGER ::= 8 -- Maximum number of supported NAICS capability set

maxBands INTEGER ::= 1024 -- Maximum number of supported bands in UE capability.

maxBandsMRDC INTEGER ::= 1280

maxBandsEUTRA INTEGER ::= 256

maxCellReport INTEGER ::= 8

maxDRB INTEGER ::= 29 -- Maximum number of DRBs (that can be added in DRB-ToAddModLIst).

maxFreq INTEGER ::= 8 -- Max number of frequencies.

maxFreqLayers INTEGER ::= 4 -- Max number of frequency layers.

maxFreqIDC-r16 INTEGER ::= 128 -- Max number of frequencies for IDC indication.

maxCombIDC-r16 INTEGER ::= 128 -- Max number of reported UL CA for IDC indication.

maxFreqIDC-MRDC INTEGER ::= 32 -- Maximum number of candidate NR frequencies for MR-DC IDC indication

maxNrofCandidateBeams INTEGER ::= 16 -- Max number of PRACH-ResourceDedicatedBFR that in BFR config.

maxNrofCandidateBeams-r16 INTEGER ::= 64 -- Max number of candidate beam resources in BFR config.

maxNrofCandidateBeamsExt-r16 INTEGER ::= 48 -- Max number of PRACH-ResourceDedicatedBFR in the CandidateBeamRSListExt

maxNrofPCIsPerSMTC INTEGER ::= 64 -- Maximun number of PCIs per SMTC.

maxNrofQFIs INTEGER ::= 64

maxNrofResourceAvailabilityPerCombination-r16 INTEGER ::= 256

maxNrOfSemiPersistentPUSCH-Triggers INTEGER ::= 64 -- Maximum number of triggers for semi persistent reporting on PUSCH

maxNrofSR-Resources INTEGER ::= 8 -- Maximum number of SR resources per BWP in a cell.

maxNrofSlotFormatsPerCombination INTEGER ::= 256

maxNrofSpatialRelationInfos INTEGER ::= 8

maxNrofSpatialRelationInfos-plus-1 INTEGER ::= 9

maxNrofSpatialRelationInfos-r16 INTEGER ::= 64

maxNrofSpatialRelationInfosDiff-r16 INTEGER ::= 56 -- Difference between maxNrofSpatialRelationInfos-r16 and maxNrofSpatialRelationInfos

maxNrofIndexesToReport INTEGER ::= 32

maxNrofIndexesToReport2 INTEGER ::= 64

maxNrofSSBs-r16 INTEGER ::= 64 -- Maximum number of SSB resources in a resource set.

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

maxNrofS-NSSAI INTEGER ::= 8 -- Maximum number of S-NSSAI.

maxNrofTCI-StatesPDCCH INTEGER ::= 64

maxNrofTCI-States INTEGER ::= 128 -- Maximum number of TCI states.

maxNrofTCI-States-1 INTEGER ::= 127 -- Maximum number of TCI states minus 1.

maxNrofUL-Allocations INTEGER ::= 16 -- Maximum number of PUSCH time domain resource allocations.

maxQFI INTEGER ::= 63

maxRA-CSIRS-Resources INTEGER ::= 96

maxRA-OccasionsPerCSIRS INTEGER ::= 64 -- Maximum number of RA occasions for one CSI-RS

maxRA-Occasions-1 INTEGER ::= 511 -- Maximum number of RA occasions in the system

maxRA-SSB-Resources INTEGER ::= 64

maxSCSs INTEGER ::= 5

maxSecondaryCellGroups INTEGER ::= 3

maxNrofServingCellsEUTRA INTEGER ::= 32

maxMBSFN-Allocations INTEGER ::= 8

maxNrofMultiBands INTEGER ::= 8

maxCellSFTD INTEGER ::= 3 -- Maximum number of cells for SFTD reporting

maxReportConfigId INTEGER ::= 64

maxNrofCodebooks INTEGER ::= 16 -- Maximum number of codebooks suppoted by the UE

maxNrofCSI-RS-ResourcesExt-r16 INTEGER ::= 16 -- Maximum number of codebook resources supported by the UE for eType2/Codebook combo

maxNrofCSI-RS-Resources INTEGER ::= 7 -- Maximum number of codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-r16 INTEGER ::= 512 -- Maximum number of alternative codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-1-r16 INTEGER ::= 511 -- Maximum number of alternative codebook resources supported by the UE minus 1

maxNrofSRI-PUSCH-Mappings INTEGER ::= 16

maxNrofSRI-PUSCH-Mappings-1 INTEGER ::= 15

maxSIB INTEGER::= 32 -- Maximum number of SIBs

maxSI-Message INTEGER::= 32 -- Maximum number of SI messages

maxPO-perPF INTEGER ::= 4 -- Maximum number of paging occasion per paging frame

maxAccessCat-1 INTEGER ::= 63 -- Maximum number of Access Categories minus 1

maxBarringInfoSet INTEGER ::= 8 -- Maximum number of Access Categories

maxCellEUTRA INTEGER ::= 8 -- Maximum number of E-UTRA cells in SIB list

maxEUTRA-Carrier INTEGER ::= 8 -- Maximum number of E-UTRA carriers in SIB list

maxPLMNIdentities INTEGER ::= 8 -- Maximum number of PLMN identites in RAN area configurations

maxDownlinkFeatureSets INTEGER ::= 1024 -- (for NR DL) Total number of FeatureSets (size of the pool)

maxUplinkFeatureSets INTEGER ::= 1024 -- (for NR UL) Total number of FeatureSets (size of the pool)

maxEUTRA-DL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxEUTRA-UL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxFeatureSetsPerBand INTEGER ::= 128 -- (for NR) The number of feature sets associated with one band.

maxPerCC-FeatureSets INTEGER ::= 1024 -- (for NR) Total number of CC-specific FeatureSets (size of the pool)

maxFeatureSetCombinations INTEGER ::= 1024 -- (for MR-DC/NR)Total number of Feature set combinations (size of the pool)

maxInterRAT-RSTD-Freq INTEGER ::= 3

maxHRNN-Len-r16 INTEGER ::= 48 -- Maximum length of HRNNs

maxNPN-r16 INTEGER ::= 12 -- Maximum number of NPNs broadcast and reported by UE at establishment

maxNrOfMinSchedulingOffsetValues-r16 INTEGER ::= 2 -- Maximum number of min. scheduling offset (K0/K2) configurations

maxK0-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K2)

maxDCI-2-6-Size-r16 INTEGER ::= 140 -- Maximum size of DCI format 2-6

maxDCI-2-6-Size-1-r16 INTEGER ::= 139 -- Maximum DCI format 2-6 size minus 1

maxNrofUL-Allocations-r16 INTEGER ::= 64 -- Maximum number of PUSCH time domain resource allocations

maxNrofP0-PUSCH-Set-r16 INTEGER ::= 2 -- Maximum number of P0 PUSCH set(s)

maxOnDemandSIB-r16 INTEGER ::= 8 -- Maximum number of SIB(s) that can be requested on-demand

maxOnDemandPosSIB-r16 INTEGER ::= 32 -- Maximum number of posSIB(s) that can be requested on-demand

maxCI-DCI-PayloadSize-r16 INTEGER ::= 126 -- Maximum number of the DCI size for CI

maxCI-DCI-PayloadSize-r16-1 INTEGER ::= 125 -- Maximum number of the DCI size for CI minus 1

maxWLAN-Id-Report-r16 INTEGER ::= 32 -- Maximum number of WLAN IDs to report

maxWLAN-Name-r16 INTEGER ::= 4 -- Maximum number of WLAN name

maxRAReport-r16 INTEGER ::= 8 -- Maximum number of RA procedures information to be included in the RA report

maxTxConfig-r16 INTEGER ::= 64 -- Maximum number of sidelink transmission parameters configurations

maxTxConfig-1-r16 INTEGER ::= 63 -- Maximum number of sidelink transmission parameters configurations minus 1

maxPSSCH-TxConfig-r16 INTEGER ::= 16 -- Maximum number of PSSCH TX configurations

maxNrofCLI-RSSI-Resources-r16 INTEGER ::= 64 -- Maximum number of CLI-RSSI resources for UE

maxNrofCLI-RSSI-Resources-r16-1 INTEGER ::= 63 -- Maximum number of CLI-RSSI resources for UE minus 1

maxNrofCLI-SRS-Resources-r16 INTEGER ::= 32 -- Maximum number of SRS resources for CLI measurement for UE

maxCLI-Report-r16 INTEGER ::= 8

maxNrofConfiguredGrantConfig-r16 INTEGER ::= 12 -- Maximum number of configured grant configurations per BWP

maxNrofConfiguredGrantConfig-r16-1 INTEGER ::= 11 -- Maximum number of configured grant configurations per BWP minus 1

maxNrofCG-Type2DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for type 2 configured grants per BWP

maxNrofConfiguredGrantConfigMAC-r16 INTEGER ::= 32 -- Maximum number of configured grant configurations per MAC entity

maxNrofConfiguredGrantConfigMAC-r16-1 INTEGER ::= 31 -- Maximum number of configured grant configurations per MAC entity minus 1

maxNrofSPS-Config-r16 INTEGER ::= 8 -- Maximum number of SPS configurations per BWP

maxNrofSPS-Config-r16-1 INTEGER ::= 7 -- Maximum number of SPS configurations per BWP minus 1

maxNrofSPS-DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for SPS per BWP

maxNrofDormancyGroups INTEGER ::= 5 --

maxNrofPUCCH-ResourceGroups-1-r16 INTEGER ::= 3 --

maxNrofServingCellsTCI-r16 INTEGER ::= 32 -- Maximum number of serving cells in simultaneousTCI-UpdateList

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

-- ASN1STOP

*End of change*