**3GPP TSG-RAN2 Meeting # 112 *R2-200xxxx***

**E-meeting, November 2nd-13th**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **<Spec#>** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **<Version#>** |  |
|  | | | | | | | | |
| *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:*** | Update on V2X UE capability | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | OPPO | | | | | | | | | |
| ***Source to TSG:*** | RAN2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_V2X\_NRSL-Core | | | | |  | ***Date:*** | | | 2020-10-08 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*Change Start*

6.3.3 UE capability information elements

– *AccessStratumRelease*

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

***AccessStratumRelease* information element**

-- ASN1START

-- TAG-ACCESSSTRATUMRELEASE-START

AccessStratumRelease ::= ENUMERATED {

rel15, rel16, spare6, spare5, spare4, spare3, spare2, spare1, ... }

-- TAG-ACCESSSTRATUMRELEASE-STOP

-- ASN1STOP

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

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

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-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-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-v16xy ::= SEQUENCE {

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

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

}

-- 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. | |

– *BandCombinationListSidelinkEUTRA-NR*

The IE *BandCombinationListSidelinkEUTRA-NR* contains a list of V2X sidelink and NR sidelink band combinations.

**BandCombinationListSidelinkEUTRA-NR information element**

-- ASN1START

-- TAG-BANDCOMBINATIONLISTSIDELINKEUTRA-NR-START

BandCombinationListSidelinkEUTRA-NR-r16 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkEUTRA-NR-r16

BandCombinationListSidelinkEUTRA-NR-v16xy ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkEUTRA-NR-v16xy

BandCombinationParametersSidelinkEUTRA-NR-r16 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkEUTRA-NR-r16

BandCombinationParametersSidelinkEUTRA-NR-v16xy ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkEUTRA-NR-v16xy

BandParametersSidelinkEUTRA-NR-r16 ::= CHOICE {

eutra SEQUENCE {

bandParametersSidelinkEUTRA1-r16 OCTET STRING OPTIONAL,

bandParametersSidelinkEUTRA2-r16 OCTET STRING OPTIONAL

},

nr SEQUENCE {

bandParametersSidelinkNR-r16 BandParametersSidelink-r16

}

}

BandParametersSidelinkEUTRA-NR-v16xy ::= SEQUENCE {

tx-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

rx-Sidelink-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-BANDCOMBINATIONLISTSIDELINKEUTRA-NR-STOP

-- ASN1STOP

|  |
| --- |
| ***BandCombinationSidelink* field descriptions** |
| ***bandParametersSidelinkEUTRA1,*** ***bandParametersSidelinkEUTRA2***  This field includes the *V2X-BandParameters-r14* and *V2X-BandParameters-v1530* IE as specified in 36.331 [10]. It is used for reporting the per-band capability for V2X sidelink communication. |

– *CA-BandwidthClassEUTRA*

The IE *CA-BandwidthClassEUTRA* indicates the E-UTRA CA bandwidth class as defined in TS 36.101 [22], table 5.6A-1.

***CA-BandwidthClassEUTRA* information element**

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSEUTRA-START

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

-- TAG-CA-BANDWIDTHCLASSEUTRA-STOP

-- ASN1STOP

– *CA-BandwidthClassNR*

The IE *CA-BandwidthClassNR* indicates the NR CA bandwidth class as defined in TS 38.101-1 [15], table 5.3A.5-1 and TS 38.101-2 [39], table 5.3A.4-1.

***CA-BandwidthClassNR* information element**

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSNR-START

CA-BandwidthClassNR ::= ENUMERATED {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, ...}

-- TAG-CA-BANDWIDTHCLASSNR-STOP

-- ASN1STOP

– *CA-ParametersEUTRA*

The IE *CA-ParametersEUTRA* contains the E-UTRA part of band combination parameters for a given MR-DC band combination.

NOTE: If additional E-UTRA band combination parameters are defined in TS 36.331 [10], which are supported for MR-DC, they will be defined here as well.

***CA-ParametersEUTRA* information element**

-- ASN1START

-- TAG-CA-PARAMETERSEUTRA-START

CA-ParametersEUTRA ::= SEQUENCE {

multipleTimingAdvance ENUMERATED {supported} OPTIONAL,

simultaneousRx-Tx ENUMERATED {supported} OPTIONAL,

supportedNAICS-2CRS-AP BIT STRING (SIZE (1..8)) OPTIONAL,

additionalRx-Tx-PerformanceReq ENUMERATED {supported} OPTIONAL,

ue-CA-PowerClass-N ENUMERATED {class2} OPTIONAL,

supportedBandwidthCombinationSetEUTRA-v1530 BIT STRING (SIZE (1..32)) OPTIONAL,

...

}

CA-ParametersEUTRA-v1560 ::= SEQUENCE {

fd-MIMO-TotalWeightedLayers INTEGER (2..128) OPTIONAL

}

CA-ParametersEUTRA-v1570 ::= SEQUENCE {

dl-1024QAM-TotalWeightedLayers INTEGER (0..10) OPTIONAL

}

-- TAG-CA-PARAMETERSEUTRA-STOP

-- ASN1STOP

– *CA-ParametersNR*

The IE *CA-ParametersNR* contains carrier aggregation 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

}

-- 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

}

-- 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. |

– *CarrierAggregationVariant*

The IE *CarrierAggregationVariant* informs the network about supported "placement" of the SpCell in an NR cell group.

***CarrierAggregationVariant* information element**

-- ASN1START

-- TAG-CARRIERAGGREGATIONVARIANT-START

CarrierAggregationVariant ::= SEQUENCE {

fr1fdd-FR1TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR1TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR2TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL,

fr1tdd-FR2TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

fr1tdd-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL

}

-- TAG-CARRIERAGGREGATIONVARIANT-STOP

-- ASN1STOP

– *CodebookParameters*

The IE *CodebookParameters* is used to convey codebook related parameters.

***CodebookParameters* information element**

-- ASN1START

-- TAG-CODEBOOKPARAMETERS-START

CodebookParameters ::= SEQUENCE {

type1 SEQUENCE {

singlePanel SEQUENCE {

supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

modes ENUMERATED {mode1, mode1andMode2},

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

},

multiPanel SEQUENCE {

supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

modes ENUMERATED {mode1, mode2, both},

nrofPanels ENUMERATED {n2, n4},

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

} OPTIONAL

},

type2 SEQUENCE {

supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

parameterLx INTEGER (2..4),

amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

amplitudeSubsetRestriction ENUMERATED {supported} OPTIONAL

} OPTIONAL,

type2-PortSelection SEQUENCE {

supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

parameterLx INTEGER (2..4),

amplitudeScalingType ENUMERATED {wideband, widebandAndSubband}

} OPTIONAL

}

CodebookParameters-v1610 ::= SEQUENCE {

supportedCSI-RS-ResourceListAlt-r16 SEQUENCE {

type1-SinglePanel-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

type1-MultiPanel-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

type2-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

type2-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL

} OPTIONAL

}

CodebookParametersAddition-r16 ::= SEQUENCE {

etype2-r16 SEQUENCE {

-- R1 16-3a Regular eType 2 R=1

etype2R1-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

},

-- R1 16-3a-1 Regular eType 2 R=2

etype2R2-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

-- R1 16-3a-2: Support of parameter combinations 7-8

paramComb7-8-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-3a-3: Support of rank 3,4

rank3-4-r16 ENUMERATED {supported} OPTIONAL,

-- R1 16-3a-4: CBSR with soft amplitude restriction

softAmpRestriction-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

etype2-PS-r16 SEQUENCE {

-- R1 16-3b Regular eType 2 R=1 PortSelection

etype2R1-PortSelection-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

},

-- R1 16-3b-1 Regular eType 2 R=2 PortSelection

etype2R2-PortSelection-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

-- R1 16-3b-2: Support of rank 3,4

rank3-4-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL

}

CodebookComboParametersAddition-r16 ::= SEQUENCE {

-- R1 16-8 Mixed codebook types

type1SP-Type2-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-Type2PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-eType2R1-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-eType2R2-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-eType2R1PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-eType2R2PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1SP-Type2-Type2PS-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-Type2-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-Type2PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-eType2R1-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-eType2R2-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-eType2R1PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-eType2R2PS-null-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL,

type1MP-Type2-Type2PS-r16 SEQUENCE {

supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

} OPTIONAL

}

CodebookParametersAdditionPerBC-r16::= SEQUENCE {

-- R1 16-3a Regular eType 2 R=1

etype2R1-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

-- R1 16-3a-1 Regular eType 2 R=2

etype2R2-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

-- R1 16-3b Regular eType 2 R=1 PortSelection

etype2R1-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

-- R1 16-3b-1 Regular eType 2 R=2 PortSelection

etype2R2-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL

}

CodebookComboParametersAdditionPerBC-r16::= SEQUENCE {

-- R1 16-8 Mixed codebook types

type1SP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1SP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL,

type1MP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

OPTIONAL

}

CodebookVariantsList-r16 ::= SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesAlt-r16)) OF SupportedCSI-RS-Resource

SupportedCSI-RS-Resource ::= SEQUENCE {

maxNumberTxPortsPerResource ENUMERATED {p2, p4, p8, p12, p16, p24, p32},

maxNumberResourcesPerBand INTEGER (1..64),

totalNumberTxPortsPerBand INTEGER (2..256)

}

-- TAG-CODEBOOKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| ***CodebookParameters* field descriptions** |
| ***supportedCSI-RS-ResourceListAlt***  This field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type. The supported CSI-RS resource is indicated by an integer value which pinpoints *SupportedCSI-RS-Resource* defined in *CodebookVariantsList*. The value 0 corresponds to the first entry of *CodebookVariantsList*. The value 1 corresponds to the second entry of *CodebookVariantsList*, and so on. For each codebook type, the field shall be included in both *codebookParametersPerBC* and *codebookParametersPerBand*. |

– *FeatureSetCombination*

The IE *FeatureSetCombination* is a two-dimensional matrix of *FeatureSet* entries.

Each *FeatureSetsPerBand* contains a list of feature sets applicable to the carrier(s) of one band entry of the associated band combination. Across the associated bands, the UE shall support the combination of *FeatureSets* at the same position in the *FeatureSetsPerBand*. All *FeatureSetsPerBand* in one *FeatureSetCombination* must have the same number of entries.

The number of *FeatureSetsPerBand* in the *FeatureSetCombination* must be equal to the number of band entries in an associated band combination. The first *FeatureSetPerBand* applies to the first band entry of the band combination, and so on.

Each *FeatureSet* contains either a pair of NR or E-UTRA feature set IDs for UL and DL.

In case of NR, the actual feature sets for UL and DL are defined in the *FeatureSets* IE and referred to from here by their ID, i.e., their position in the *featureSetsUplink* / *featureSetsDownlink* list in the FeatureSet IE.

In case of E-UTRA, the feature sets referred to from this list are defined in TS 36.331 [10] and conveyed as part of the *UE-EUTRA-Capability* container.

The *FeatureSetUplink* and *FeatureSetDownlink* referred to from the *FeatureSet* comprise, among other information, a set of *FeatureSetUplinkPerCC-Id:s* and *FeatureSetDownlinkPerCC-Id:s*. The number of these per-CC IDs determines the number of carriers that the UE is able to aggregate contiguously in frequency domain in the corresponding band. The number of carriers supported by the UE is also restricted by the bandwidth class indicated in the associated *BandCombination*, if present.

In feature set combinations the UE shall exclude entries for fallback combinations with same capabilities, since the network may anyway assume that the UE supports those.

NOTE 1: The UE may advertise fallback band-combinations in which it supports additional functionality explicitly in two ways: Either by setting FeatureSet IDs to zero (inter-band and intra-band non-contiguous fallback) and by reducing the number of FeatureSet-PerCC Ids in a Feature Set (intra-band contiguous fallback). Or by separate *BandCombination* entries with associated *FeatureSetCombinations*.

NOTE 2: The UE may advertise a *FeatureSetCombination* containing only fallback band combinations. That means, in a *FeatureSetCombination,* each group of *FeatureSets* across the bands may contain at least one pair of *FeatureSetUplinkId* and *FeatureSetDownlinkId* which is set to 0/0.

NOTE 3: The Network configures serving cell(s) and BWP(s) configuration to comply with capabilities derived from the combination of FeatureSets at the same position in the FeatureSetsPerBand, regardless of activated/deactivated serving cell(s) and BWP(s).

***FeatureSetCombination* information element**

-- ASN1START

-- TAG-FEATURESETCOMBINATION-START

FeatureSetCombination ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF FeatureSetsPerBand

FeatureSetsPerBand ::= SEQUENCE (SIZE (1..maxFeatureSetsPerBand)) OF FeatureSet

FeatureSet ::= CHOICE {

eutra SEQUENCE {

downlinkSetEUTRA FeatureSetEUTRA-DownlinkId,

uplinkSetEUTRA FeatureSetEUTRA-UplinkId

},

nr SEQUENCE {

downlinkSetNR FeatureSetDownlinkId,

uplinkSetNR FeatureSetUplinkId

}

}

-- TAG-FEATURESETCOMBINATION-STOP

-- ASN1STOP

– *FeatureSetCombinationId*

The IE *FeatureSetCombinationId* identifies a *FeatureSetCombination*. The *FeatureSetCombinationId* of a *FeatureSetCombination* is the position of the *FeatureSetCombination* in the featureSetCombinations list (in *UE-NR-Capability* or *UE-MRDC-Capability*). The *FeatureSetCombinationId* = 0 refers to the first entry in the *featureSetCombinations* list (in *UE-NR-Capability* or *UE-MRDC-Capability*).

NOTE: The *FeatureSetCombinationId* = 1024 is not used due to the maximum entry number of *featureSetCombinations*.

***FeatureSetCombinationId* information element**

-- ASN1START

-- TAG-FEATURESETCOMBINATIONID-START

FeatureSetCombinationId ::= INTEGER (0.. maxFeatureSetCombinations)

-- TAG-FEATURESETCOMBINATIONID-STOP

-- ASN1STOP

– *FeatureSetDownlink*

The IE *FeatureSetDownlink* indicates a set of features that the UE supports on the carriers corresponding to one band entry in a band combination.

***FeatureSetDownlink* information element**

-- ASN1START

-- TAG-FEATURESETDOWNLINK-START

FeatureSetDownlink ::= SEQUENCE {

featureSetListPerDownlinkCC SEQUENCE (SIZE (1..maxNrofServingCells)) OF FeatureSetDownlinkPerCC-Id,

intraBandFreqSeparationDL FreqSeparationClass OPTIONAL,

scalingFactor ENUMERATED {f0p4, f0p75, f0p8} OPTIONAL,

crossCarrierScheduling-OtherSCS ENUMERATED {supported} OPTIONAL,

scellWithoutSSB ENUMERATED {supported} OPTIONAL,

csi-RS-MeasSCellWithoutSSB ENUMERATED {supported} OPTIONAL,

dummy1 ENUMERATED {supported} OPTIONAL,

type1-3-CSS ENUMERATED {supported} OPTIONAL,

pdcch-MonitoringAnyOccasions ENUMERATED {withoutDCI-Gap, withDCI-Gap} OPTIONAL,

dummy2 ENUMERATED {supported} OPTIONAL,

ue-SpecificUL-DL-Assignment ENUMERATED {supported} OPTIONAL,

searchSpaceSharingCA-DL ENUMERATED {supported} OPTIONAL,

timeDurationForQCL SEQUENCE {

scs-60kHz ENUMERATED {s7, s14, s28} OPTIONAL,

scs-120kHz ENUMERATED {s14, s28} OPTIONAL

} OPTIONAL,

pdsch-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,

dummy3 DummyA OPTIONAL,

dummy4 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyB OPTIONAL,

dummy5 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyC OPTIONAL,

dummy6 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyD OPTIONAL,

dummy7 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyE OPTIONAL

}

FeatureSetDownlink-v1540 ::= SEQUENCE {

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

additionalDMRS-DL-Alt ENUMERATED {supported} OPTIONAL,

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

oneFL-DMRS-ThreeAdditionalDMRS-DL ENUMERATED {supported} OPTIONAL,

pdcch-MonitoringAnyOccasionsWithSpanGap 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,

pdsch-SeparationWithGap ENUMERATED {supported} OPTIONAL,

pdsch-ProcessingType2 SEQUENCE {

scs-15kHz ProcessingParameters OPTIONAL,

scs-30kHz ProcessingParameters OPTIONAL,

scs-60kHz ProcessingParameters OPTIONAL

} OPTIONAL,

pdsch-ProcessingType2-Limited SEQUENCE {

differentTB-PerSlot-SCS-30kHz ENUMERATED {upto1, upto2, upto4, upto7}

} OPTIONAL,

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

}

FeatureSetDownlink-v15a0 ::= SEQUENCE {

supportedSRS-Resources SRS-Resources OPTIONAL

}

FeatureSetDownlink-v1610 ::= SEQUENCE {

-- R1 22-4e/4f/4g/4h: CBG based reception for DL with unicast PDSCH(s) per slot per CC with UE processing time Capability 1

cbgPDSCH-ProcessingType1-NumberOfTB-PerSlot SEQUENCE {

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

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

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

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

} OPTIONAL,

-- R1 22-3e/3f/3g/3h: CBG based reception for DL with unicast PDSCH(s) per slot per CC with UE processing time Capability 2

cbgPDSCH-ProcessingType2-NumberOfTB-PerSlot SEQUENCE {

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

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

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

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

} OPTIONAL,

intraFreqDAPS-r16 SEQUENCE {

intraFreqDiffSCS-DAPS-r16 ENUMERATED {supported} OPTIONAL,

intraFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

intraBandFreqSeparationDL-v1620 FreqSeparationClassDL-v1620 OPTIONAL,

intraBandFreqSeparationDL-Only-r16 FreqSeparationClassDL-Only-r16 OPTIONAL,

-- R1 11-2: Rel-16 PDCCH monitoring capability

pdcch-Monitoring-r16 SEQUENCE {

pdsch-ProcessingType1-r16 SEQUENCE {

scs-15kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL,

scs-30kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL

} OPTIONAL,

pdsch-ProcessingType2-r16 SEQUENCE {

scs-15kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL,

scs-30kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL

} OPTIONAL

} OPTIONAL,

-- R1 11-2b: Mix of Rel. 16 PDCCH monitoring capability and Rel. 15 PDCCH monitoring capability on different carriers

pdcch-MonitoringMixed-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-5c: Processing up to X unicast DCI scheduling for DL 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 16-2b-1: Support of single-DCI based SDM scheme

singleDCI-SDM-scheme-r16 ENUMERATED {supported} OPTIONAL

}

PDCCH-MonitoringOccasions-r16 ::= SEQUENCE {

period7span3-r16 ENUMERATED {supported} OPTIONAL,

period4span3-r16 ENUMERATED {supported} OPTIONAL,

period2span2-r16 ENUMERATED {supported} OPTIONAL

}

DummyA ::= SEQUENCE {

maxNumberNZP-CSI-RS-PerCC INTEGER (1..32),

maxNumberPortsAcrossNZP-CSI-RS-PerCC ENUMERATED {p2, p4, p8, p12, p16, p24, p32, p40, p48, p56, p64, p72, p80,

p88, p96, p104, p112, p120, p128, p136, p144, p152, p160, p168,

p176, p184, p192, p200, p208, p216, p224, p232, p240, p248, p256},

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

maxNumberSimultaneousCSI-RS-ActBWP-AllCC ENUMERATED {n5, n6, n7, n8, n9, n10, n12, n14, n16, n18, n20, n22, n24, n26,

n28, n30, n32, n34, n36, n38, n40, n42, n44, n46, n48, n50, n52,

n54, n56, n58, n60, n62, n64},

totalNumberPortsSimultaneousCSI-RS-ActBWP-AllCC ENUMERATED {p8, p12, p16, p24, p32, p40, p48, p56, p64, p72, p80,

p88, p96, p104, p112, p120, p128, p136, p144, p152, p160, p168,

p176, p184, p192, p200, p208, p216, p224, p232, p240, p248, p256}

}

DummyB ::= SEQUENCE {

maxNumberTxPortsPerResource ENUMERATED {p2, p4, p8, p12, p16, p24, p32},

maxNumberResources INTEGER (1..64),

totalNumberTxPorts INTEGER (2..256),

supportedCodebookMode ENUMERATED {mode1, mode1AndMode2},

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyC ::= SEQUENCE {

maxNumberTxPortsPerResource ENUMERATED {p8, p16, p32},

maxNumberResources INTEGER (1..64),

totalNumberTxPorts INTEGER (2..256),

supportedCodebookMode ENUMERATED {mode1, mode2, both},

supportedNumberPanels ENUMERATED {n2, n4},

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyD ::= SEQUENCE {

maxNumberTxPortsPerResource ENUMERATED {p4, p8, p12, p16, p24, p32},

maxNumberResources INTEGER (1..64),

totalNumberTxPorts INTEGER (2..256),

parameterLx INTEGER (2..4),

amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

amplitudeSubsetRestriction ENUMERATED {supported} OPTIONAL,

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyE ::= SEQUENCE {

maxNumberTxPortsPerResource ENUMERATED {p4, p8, p12, p16, p24, p32},

maxNumberResources INTEGER (1..64),

totalNumberTxPorts INTEGER (2..256),

parameterLx INTEGER (2..4),

amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

-- TAG-FEATURESETDOWNLINK-STOP

-- ASN1STOP

|  |
| --- |
| ***FeatureSetDownlink* field descriptions** |
| ***crossCarrierScheduling-OtherSCS***  The UE shall set this field to the same value as *crossCarrierScheduling-OtherSCS* in the associated *FeatureSetUplink* (if present). |
| ***featureSetListPerDownlinkCC***  Indicates which features the UE supports on the individual DL carriers of the feature set (and hence of a band entry that refer to the feature set). The UE shall hence include at least as many *FeatureSetDownlinkPerCC-Id* in this list as the number of carriers it supports according to the *ca-BandwidthClassDL*, except if indicating additional functionality by reducing the number of *FeatureSetDownlinkPerCC-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 *FeatureSetDownlinkPerCC-Id* in this list. |
| ***supportedSRS-Resources***  Indicates supported SRS resources for SRS carrier switching to the band associated with this *FeatureSetDownlink*. The UE is only allowed to set this field for a band with associated *FeatureSetUplinkId* set to 0. |

– *FeatureSetDownlinkId*

The IE *FeatureSetDownlinkId* identifies a downlink feature set. The *FeatureSetDownlinkId* of a *FeatureSetDownlink* is the index position of the *FeatureSetDownlink* in the *featureSetsDownlink* list in the *FeatureSets* IE. The first element in that list is referred to by *FeatureSetDownlinkId* = 1. The *FeatureSetDownlinkId=0* is not used by an actual *FeatureSetDownlink* but means that the UE does not support a carrier in this band of a band combination.

***FeatureSetDownlinkId* information element**

-- ASN1START

-- TAG-FEATURESETDOWNLINKID-START

FeatureSetDownlinkId ::= INTEGER (0..maxDownlinkFeatureSets)

-- TAG-FEATURESETDOWNLINKID-STOP

-- ASN1STOP

– *FeatureSetDownlinkPerCC*

The IE *FeatureSetDownlinkPerCC* indicates a set of features that the UE supports on the corresponding carrier of one band entry of a band combination.

***FeatureSetDownlinkPerCC* information element**

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-START

FeatureSetDownlinkPerCC ::= SEQUENCE {

supportedSubcarrierSpacingDL SubcarrierSpacing,

supportedBandwidthDL SupportedBandwidth,

channelBW-90mhz ENUMERATED {supported} OPTIONAL,

maxNumberMIMO-LayersPDSCH MIMO-LayersDL OPTIONAL,

supportedModulationOrderDL ModulationOrder OPTIONAL

}

FeatureSetDownlinkPerCC-v1620 ::= SEQUENCE {

-- R1 16-2a: Mulit-DCI based multi-TRP

multiDCI-MultiTRP-r16 MultiDCI-MultiTRP-r16 OPTIONAL,

-- R1 16-2b-3: Support of single-DCI based FDMSchemeB

supportFDM-SchemeB-r16 ENUMERATED {supported} OPTIONAL

}

MultiDCI-MultiTRP-r16 ::= SEQUENCE {

maxNumberCORESET-r16 ENUMERATED {n2, n3, n4, n5},

maxNumberCORESETPerPoolIndex-r16 INTEGER (1..3),

maxNumberUnicastPDSCH-PerPool-r16 ENUMERATED {n1, n2, n3, n4, n7}

}

-- TAG-FEATURESETDOWNLINKPERCC-STOP

-- ASN1STOP

– *FeatureSetDownlinkPerCC-Id*

The IE *FeatureSetDownlinkPerCC-Id* identifies a set of features applicable to one carrier of a feature set. The *FeatureSetDownlinkPerCC-Id* of a *FeatureSetDownlinkPerCC* is the index position of the *FeatureSetDownlinkPerCC* in the *featureSetsDownlinkPerCC*. The first element in the list is referred to by *FeatureSetDownlinkPerCC-Id* = 1, and so on.

***FeatureSetDownlinkPerCC-Id* information element**

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-ID-START

FeatureSetDownlinkPerCC-Id ::= INTEGER (1..maxPerCC-FeatureSets)

-- TAG-FEATURESETDOWNLINKPERCC-ID-STOP

-- ASN1STOP

– *FeatureSetEUTRA-DownlinkId*

The IE *FeatureSetEUTRA-DownlinkId* identifies a downlink feature set in E-UTRA list (see TS 36.331 [10]. The first element in that list is referred to by *FeatureSetEUTRA-DownlinkId* = 1. The *FeatureSetEUTRA-DownlinkId=0* is used when the UE does not support a carrier in this band of a band combination.

***FeatureSetEUTRA-DownlinkId* information element**

-- ASN1START

-- TAG-FEATURESETEUTRADOWNLINKID-START

FeatureSetEUTRA-DownlinkId ::= INTEGER (0..maxEUTRA-DL-FeatureSets)

-- TAG-FEATURESETEUTRADOWNLINKID-STOP

-- ASN1STOP

– *FeatureSetEUTRA-UplinkId*

The IE *FeatureSetEUTRA-UplinkId* identifies an uplink feature set in E-UTRA list (see TS 36.331 [10]. The first element in that list is referred to by *FeatureSetEUTRA-UplinkId* = 1. The *FeatureSetEUTRA-UplinkId* *=0* is used when the UE does not support a carrier in this band of a band combination.

***FeatureSetEUTRA-UplinkId* information element**

-- ASN1START

-- TAG-FEATURESETEUTRAUPLINKID-START

FeatureSetEUTRA-UplinkId ::= INTEGER (0..maxEUTRA-UL-FeatureSets)

-- TAG-FEATURESETEUTRAUPLINKID-STOP

-- ASN1STOP

– *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

]]

}

-- TAG-FEATURESETS-STOP

-- ASN1STOP

– *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,

crossCarrierScheduling-OtherSCS 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 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 SEQUENCE {

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

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

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

scs-120kHz 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 SEQUENCE {

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

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

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

scs-120kHz 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,

intraFreqSemiStaticPowerSharingDAPS-Mode1-r16 ENUMERATED {supported} OPTIONAL,

intraFreqSemiStaticPowerSharingDAPS-Mode2-r16 ENUMERATED {supported} OPTIONAL,

intraFreqDynamicPowerSharingDAPS-r16 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 at most 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

}

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** |
| ***crossCarrierScheduling-OtherSCS***  The UE shall set this field to the same value as *crossCarrierScheduling-OtherSCS* in the associated *FeatureSetDownlink* (if present). |
| ***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. |

– *FeatureSetUplinkId*

The IE *FeatureSetUplinkId* identifies an uplink feature set. The *FeatureSetUplinkId* of a *FeatureSetUplink* is the index position of the *FeatureSetUplink* in the *featureSetsUplink* list in the *FeatureSets* IE. The first element in the list is referred to by *FeatureSetUplinkId* = 1, and so on. The *FeatureSetUplinkId =0* is not used by an actual *FeatureSetUplink* but means that the UE does not support a carrier in this band of a band combination.

***FeatureSetUplinkId* information element**

-- ASN1START

-- TAG-FEATURESETUPLINKID-START

FeatureSetUplinkId ::= INTEGER (0..maxUplinkFeatureSets)

-- TAG-FEATURESETUPLINKID-STOP

-- ASN1STOP

– *FeatureSetUplinkPerCC*

The IE *FeatureSetUplinkPerCC* indicates a set of features that the UE supports on the corresponding carrier of one band entry of a band combination.

***FeatureSetUplinkPerCC* information element**

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-START

FeatureSetUplinkPerCC ::= SEQUENCE {

supportedSubcarrierSpacingUL SubcarrierSpacing,

supportedBandwidthUL SupportedBandwidth,

channelBW-90mhz ENUMERATED {supported} OPTIONAL,

mimo-CB-PUSCH SEQUENCE {

maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL OPTIONAL,

maxNumberSRS-ResourcePerSet INTEGER (1..2)

} OPTIONAL,

maxNumberMIMO-LayersNonCB-PUSCH MIMO-LayersUL OPTIONAL,

supportedModulationOrderUL ModulationOrder OPTIONAL

}

FeatureSetUplinkPerCC-v1540 ::= SEQUENCE {

mimo-NonCB-PUSCH SEQUENCE {

maxNumberSRS-ResourcePerSet INTEGER (1..4),

maxNumberSimultaneousSRS-ResourceTx INTEGER (1..4)

} OPTIONAL

}

-- TAG-FEATURESETUPLINKPERCC-STOP

-- ASN1STOP

– *FeatureSetUplinkPerCC-Id*

The IE *FeatureSetUplinkPerCC-Id* identifies a set of features applicable to one carrier of a feature set. The *FeatureSetUplinkPerCC-Id* of a *FeatureSetUplinkPerCC* is the index position of the *FeatureSetUplinkPerCC* in the *featureSetsUplinkPerCC*. The first element in the list is referred to by *FeatureSetUplinkPerCC-Id* = 1, and so on.

***FeatureSetUplinkPerCC-Id* information element**

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-ID-START

FeatureSetUplinkPerCC-Id ::= INTEGER (1..maxPerCC-FeatureSets)

-- TAG-FEATURESETUPLINKPERCC-ID-STOP

-- ASN1STOP

– *FreqBandIndicatorEUTRA*

-- ASN1START

-- TAG-FREQBANDINDICATOREUTRA-START

FreqBandIndicatorEUTRA ::= INTEGER (1..maxBandsEUTRA)

-- TAG-FREQBANDINDICATOREUTRA-STOP

-- ASN1STOP

– *FreqBandList*

The IE *FreqBandList* is used by the network to request NR CA, NR non-CA and/or MR-DC band combinations for specific NR and/or E-UTRA frequency bands and/or up to a specific number of carriers and/or up to specific aggregated bandwidth. This is also used to request feature sets (for NR) and feature set combinations (for NR and MR-DC).

***FreqBandList* information element**

-- ASN1START

-- TAG-FREQBANDLIST-START

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

FreqBandInformation ::= CHOICE {

bandInformationEUTRA FreqBandInformationEUTRA,

bandInformationNR FreqBandInformationNR

}

FreqBandInformationEUTRA ::= SEQUENCE {

bandEUTRA FreqBandIndicatorEUTRA,

ca-BandwidthClassDL-EUTRA CA-BandwidthClassEUTRA OPTIONAL, -- Need N

ca-BandwidthClassUL-EUTRA CA-BandwidthClassEUTRA OPTIONAL -- Need N

}

FreqBandInformationNR ::= SEQUENCE {

bandNR FreqBandIndicatorNR,

maxBandwidthRequestedDL AggregatedBandwidth OPTIONAL, -- Need N

maxBandwidthRequestedUL AggregatedBandwidth OPTIONAL, -- Need N

maxCarriersRequestedDL INTEGER (1..maxNrofServingCells) OPTIONAL, -- Need N

maxCarriersRequestedUL INTEGER (1..maxNrofServingCells) OPTIONAL -- Need N

}

AggregatedBandwidth ::= ENUMERATED {mhz50, mhz100, mhz150, mhz200, mhz250, mhz300, mhz350,

mhz400, mhz450, mhz500, mhz550, mhz600, mhz650, mhz700, mhz750, mhz800}

-- TAG-FREQBANDLIST-STOP

-- ASN1STOP

– *FreqSeparationClass*

The IE *FreqSeparationClas*s is used for an intra-band non-contiguous CA band combination to indicate frequency separation between lower edge of lowest CC and upper edge of highest CC in a frequency band.

***FreqSeparationClass* information element**

-- ASN1START

-- TAG-FREQSEPARATIONCLASS-START

FreqSeparationClass ::= ENUMERATED { mhz800, mhz1200, mhz1400, ...}

FreqSeparationClassDL-v1620 ::= ENUMERATED {mhz1000, mhz1600, mhz1800, mhz2000, mhz2200, mhz2400}

FreqSeparationClassUL-v1620 ::= ENUMERATED {mhz1000}

-- TAG-FREQSEPARATIONCLASS-STOP

-- ASN1STOP

*– FreqSeparationClassDL-Only*

The IE *FreqSeparationClassDL-Only* is used to indicate the frequency separation between lower edge of lowest CC and upper edge of highest CC of DL only frequency spectrum in a frequency band.

***FreqSeparationClassDL-Only* information element**

-- ASN1START

-- TAG-FREQSEPARATIONCLASSDL-Only-START

FreqSeparationClassDL-Only-r16 ::= ENUMERATED {mhz200, mhz400, mhz600, mhz800, mhz1000, mhz1200}

-- TAG-FREQSEPARATIONCLASSDL-Only-STOP

-- ASN1STOP

– *HighSpeedParameters*

The IE *HighSpeedParameters* is used to convey capabilities related to high speed scenarios.

***HighSpeedParameters* information element**

-- ASN1START

-- TAG-HIGHSPEEDPARAMETERS-START

HighSpeedParameters-r16 ::= SEQUENCE {

measurementEnhancement-r16 ENUMERATED {supported} OPTIONAL,

demodulationEnhancement-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-HIGHSPEEDPARAMETERS-STOP

-- ASN1STOP

– *IMS-Parameters*

The IE *IMS-Parameters* is used to convery capabilities related to IMS.

***IMS-Parameters* information element**

-- ASN1START

-- TAG-IMS-PARAMETERS-START

IMS-Parameters ::= SEQUENCE {

ims-ParametersCommon IMS-ParametersCommon OPTIONAL,

ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL,

...

}

IMS-ParametersCommon ::= SEQUENCE {

voiceOverEUTRA-5GC ENUMERATED {supported} OPTIONAL,

...,

[[

voiceOverSCG-BearerEUTRA-5GC ENUMERATED {supported} OPTIONAL

]],

[[

voiceFallbackIndicationEPS-r16 ENUMERATED {supported} OPTIONAL

]]

}

IMS-ParametersFRX-Diff ::= SEQUENCE {

voiceOverNR ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-IMS-PARAMETERS-STOP

-- ASN1STOP

– *InterRAT-Parameters*

The IE *InterRAT-Parameters* is used convey UE capabilities related to the other RATs.

***InterRAT-Parameters* information element**

-- ASN1START

-- TAG-INTERRAT-PARAMETERS-START

InterRAT-Parameters ::= SEQUENCE {

eutra EUTRA-Parameters OPTIONAL,

...,

[[

utra-FDD-r16 UTRA-FDD-Parameters-r16 OPTIONAL

]]

}

EUTRA-Parameters ::= SEQUENCE {

supportedBandListEUTRA SEQUENCE (SIZE (1..maxBandsEUTRA)) OF FreqBandIndicatorEUTRA,

eutra-ParametersCommon EUTRA-ParametersCommon OPTIONAL,

eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff OPTIONAL,

...

}

EUTRA-ParametersCommon ::= SEQUENCE {

mfbi-EUTRA ENUMERATED {supported} OPTIONAL,

modifiedMPR-BehaviorEUTRA BIT STRING (SIZE (32)) OPTIONAL,

multiNS-Pmax-EUTRA ENUMERATED {supported} OPTIONAL,

rs-SINR-MeasEUTRA ENUMERATED {supported} OPTIONAL,

...,

[[

ne-DC ENUMERATED {supported} OPTIONAL

]],

[[

nr-HO-ToEN-DC-r16 ENUMERATED {supported} OPTIONAL

]]

}

EUTRA-ParametersXDD-Diff ::= SEQUENCE {

rsrqMeasWidebandEUTRA ENUMERATED {supported} OPTIONAL,

...

}

UTRA-FDD-Parameters-r16 ::= SEQUENCE {

supportedBandListUTRA-FDD-r16 SEQUENCE (SIZE (1..maxBandsUTRA-FDD-r16)) OF SupportedBandUTRA-FDD-r16,

...

}

SupportedBandUTRA-FDD-r16 ::= ENUMERATED {

bandI, bandII, bandIII, bandIV, bandV, bandVI,

bandVII, bandVIII, bandIX, bandX, bandXI,

bandXII, bandXIII, bandXIV, bandXV, bandXVI,

bandXVII, bandXVIII, bandXIX, bandXX,

bandXXI, bandXXII, bandXXIII, bandXXIV,

bandXXV, bandXXVI, bandXXVII, bandXXVIII,

bandXXIX, bandXXX, bandXXXI, bandXXXII}

-- TAG-INTERRAT-PARAMETERS-STOP

-- ASN1STOP

– *MAC-Parameters*

The IE *MAC-Parameters* is used to convey capabilities related to MAC.

***MAC-Parameters* information element**

-- ASN1START

-- TAG-MAC-PARAMETERS-START

MAC-Parameters ::= SEQUENCE {

mac-ParametersCommon MAC-ParametersCommon OPTIONAL,

mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL

}

MAC-Parameters-v1610 ::= SEQUENCE {

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

}

MAC-ParametersCommon ::= SEQUENCE {

lcp-Restriction ENUMERATED {supported} OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

lch-ToSCellRestriction ENUMERATED {supported} OPTIONAL,

...,

[[

recommendedBitRate ENUMERATED {supported} OPTIONAL,

recommendedBitRateQuery ENUMERATED {supported} OPTIONAL

]],

[[

recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL,

preEmptiveBSR-r16 ENUMERATED {supported} OPTIONAL,

autonomousTransmission-r16 ENUMERATED {supported} OPTIONAL,

lch-PriorityBasedPrioritization-r16 ENUMERATED {supported} OPTIONAL,

lch-ToConfiguredGrantMapping-r16 ENUMERATED {supported} OPTIONAL,

lch-ToGrantPriorityRestriction-r16 ENUMERATED {supported} OPTIONAL,

singlePHR-P-r16 ENUMERATED {supported} OPTIONAL,

ul-LBT-FailureDetectionRecovery-r16 ENUMERATED {supported} OPTIONAL,

-- R4 8-1: MPE

tdd-MPE-P-MPR-Reporting-r16 ENUMERATED {supported} OPTIONAL,

lcid-ExtensionIAB-r16 ENUMERATED {supported} OPTIONAL

]]

}

MAC-ParametersFRX-Diff-r16 ::= SEQUENCE {

directMCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

directMCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

directSCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

directSCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

-- R1 19-1: DRX Adaptation

drx-Adaptation-r16 SEQUENCE {

non-SharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL,

sharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL

} OPTIONAL,

...

}

MAC-ParametersXDD-Diff ::= SEQUENCE {

skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

longDRX-Cycle ENUMERATED {supported} OPTIONAL,

shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

multipleSR-Configurations ENUMERATED {supported} OPTIONAL,

multipleConfiguredGrants ENUMERATED {supported} OPTIONAL,

...,

[[

secondaryDRX-Group-r16 ENUMERATED {supported} OPTIONAL

]]

}

MinTimeGap-r16 ::= SEQUENCE {

scs-15kHz-r16 ENUMERATED {sl1, sl3} OPTIONAL,

scs-30kHz-r16 ENUMERATED {sl1, sl6} OPTIONAL,

scs-60kHz-r16 ENUMERATED {sl1, sl12} OPTIONAL,

scs-120kHz-r16 ENUMERATED {sl2, sl24} OPTIONAL

}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

– *MeasAndMobParameters*

The IE *MeasAndMobParameters* is used to convey UE capabilities related to measurements for radio resource management (RRM), radio link monitoring (RLM) and mobility (e.g. handover).

***MeasAndMobParameters* information element**

-- ASN1START

-- TAG-MEASANDMOBPARAMETERS-START

MeasAndMobParameters ::= SEQUENCE {

measAndMobParametersCommon MeasAndMobParametersCommon OPTIONAL,

measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL,

measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

MeasAndMobParametersCommon ::= SEQUENCE {

supportedGapPattern BIT STRING (SIZE (22)) OPTIONAL,

ssb-RLM ENUMERATED {supported} OPTIONAL,

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

...,

[[

eventB-MeasAndReport ENUMERATED {supported} OPTIONAL,

handoverFDD-TDD ENUMERATED {supported} OPTIONAL,

eutra-CGI-Reporting ENUMERATED {supported} OPTIONAL,

nr-CGI-Reporting ENUMERATED {supported} OPTIONAL

]],

[[

independentGapConfig ENUMERATED {supported} OPTIONAL,

periodicEUTRA-MeasAndReport ENUMERATED {supported} OPTIONAL,

handoverFR1-FR2 ENUMERATED {supported} OPTIONAL,

maxNumberCSI-RS-RRM-RS-SINR ENUMERATED {n4, n8, n16, n32, n64, n96} OPTIONAL

]],

[[

nr-CGI-Reporting-ENDC ENUMERATED {supported} OPTIONAL

]],

[[

eutra-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

eutra-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL,

nr-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

nr-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL

]],

[[

reportAddNeighMeasForPeriodic-r16 ENUMERATED {supported} OPTIONAL,

condHandoverParametersCommon-r16 SEQUENCE {

condHandoverFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

condHandoverFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

nr-NeedForGap-Reporting-r16 ENUMERATED {supported} OPTIONAL,

supportedGapPattern-NRonly-r16 BIT STRING (SIZE (10)) OPTIONAL,

supportedGapPattern-NRonly-NEDC-r16 ENUMERATED {supported} OPTIONAL,

maxNumberCLI-RSSI-r16 ENUMERATED {n8, n16, n32, n64} OPTIONAL,

maxNumberCLI-SRS-RSRP-r16 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

maxNumberPerSlotCLI-SRS-RSRP-r16 ENUMERATED {n2, n4, n8} OPTIONAL,

mfbi-IAB-r16 ENUMERATED {supported} OPTIONAL,

multipleNS-And-Pmax-IAB-r16 ENUMERATED {supported} OPTIONAL,

nr-CGI-Reporting-NPN-r16 ENUMERATED {supported} OPTIONAL,

idleInactiveEUTRA-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

idleInactive-ValidityArea-r16 ENUMERATED {supported} OPTIONAL,

eutra-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

eutra-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

eutra-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

pcellT312-r16 ENUMERATED {supported} OPTIONAL,

supportedGapPattern-r16 BIT STRING (SIZE (2)) OPTIONAL

]]

}

MeasAndMobParametersXDD-Diff ::= SEQUENCE {

intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

eventA-MeasAndReport ENUMERATED {supported} OPTIONAL,

...,

[[

handoverInterF ENUMERATED {supported} OPTIONAL,

handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

handoverLTE-5GC ENUMERATED {supported} OPTIONAL

]],

[[

sftd-MeasNR-Neigh ENUMERATED {supported} OPTIONAL,

sftd-MeasNR-Neigh-DRX ENUMERATED {supported} OPTIONAL

]],

[[

handoverUTRA-FDD-r16 ENUMERATED {supported} OPTIONAL

]]

}

MeasAndMobParametersFRX-Diff ::= SEQUENCE {

ss-SINR-Meas ENUMERATED {supported} OPTIONAL,

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

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

csi-SINR-Meas ENUMERATED {supported} OPTIONAL,

csi-RS-RLM ENUMERATED {supported} OPTIONAL,

...,

[[

handoverInterF ENUMERATED {supported} OPTIONAL,

handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

handoverLTE-5GC ENUMERATED {supported} OPTIONAL

]],

[[

maxNumberResource-CSI-RS-RLM ENUMERATED {n2, n4, n6, n8} OPTIONAL

]],

[[

simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

]],

[[

nr-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-ENDC-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

handoverUTRA-FDD-r16 ENUMERATED {supported} OPTIONAL,

cli-RSSI-Meas-r16 ENUMERATED {supported} OPTIONAL,

cli-SRS-RSRP-Meas-r16 ENUMERATED {supported} OPTIONAL,

interFrequencyMeas-Nogap-r16 ENUMERATED {supported} OPTIONAL,

simultaneousRxDataSSB-DiffNumerology-Inter-r16 ENUMERATED {supported} OPTIONAL,

idleInactiveNR-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

-- R4 6-2: Support of beam level Early Measurement Reporting

idleInactiveNR-MeasBeamReport-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-MEASANDMOBPARAMETERS-STOP

-- ASN1STOP

– *MeasAndMobParametersMRDC*

The IE *MeasAndMobParametersMRDC* is used to convey capability parameters related to RRM measurements and RRC mobility.

***MeasAndMobParametersMRDC* information element**

-- ASN1START

-- TAG-MEASANDMOBPARAMETERSMRDC-START

MeasAndMobParametersMRDC ::= SEQUENCE {

measAndMobParametersMRDC-Common MeasAndMobParametersMRDC-Common OPTIONAL,

measAndMobParametersMRDC-XDD-Diff MeasAndMobParametersMRDC-XDD-Diff OPTIONAL,

measAndMobParametersMRDC-FRX-Diff MeasAndMobParametersMRDC-FRX-Diff OPTIONAL

}

MeasAndMobParametersMRDC-v1560 ::= SEQUENCE {

measAndMobParametersMRDC-XDD-Diff-v1560 MeasAndMobParametersMRDC-XDD-Diff-v1560 OPTIONAL

}

MeasAndMobParametersMRDC-v1610 ::= SEQUENCE {

measAndMobParametersMRDC-Common-v1610 MeasAndMobParametersMRDC-Common-v1610 OPTIONAL,

interNR-MeasEUTRA-IAB-r16 ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-Common ::= SEQUENCE {

independentGapConfig ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-Common-v1610 ::= SEQUENCE {

condPSCellChangeParametersCommon-r16 SEQUENCE {

condPSCellChangeFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

condPSCellChangeFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

pscellT312-r16 ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-XDD-Diff ::= SEQUENCE {

sftd-MeasPSCell ENUMERATED {supported} OPTIONAL,

sftd-MeasNR-Cell ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-XDD-Diff-v1560 ::= SEQUENCE {

sftd-MeasPSCell-NEDC ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-FRX-Diff ::= SEQUENCE {

simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

}

-- TAG-MEASANDMOBPARAMETERSMRDC-STOP

-- ASN1STOP

– *MIMO-Layers*

The IE *MIMO-Layers* is used to convey the number of supported MIMO layers.

***MIMO-Layers* information element**

-- ASN1START

-- TAG-MIMO-LAYERS-START

MIMO-LayersDL ::= ENUMERATED {twoLayers, fourLayers, eightLayers}

MIMO-LayersUL ::= ENUMERATED {oneLayer, twoLayers, fourLayers}

-- TAG-MIMO-LAYERS-STOP

-- ASN1STOP

– *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

]]

}

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*. |

– *ModulationOrder*

The IE *ModulationOrder* is used to convey the maximum supported modulation order.

***ModulationOrder* information element**

-- ASN1START

-- TAG-MODULATIONORDER-START

ModulationOrder ::= ENUMERATED {bpsk-halfpi, bpsk, qpsk, qam16, qam64, qam256}

-- TAG-MODULATIONORDER-STOP

-- ASN1STOP

– *MRDC-Parameters*

The IE *MRDC-Parameters* contains the band combination parameters specific to MR-DC for a given MR-DC band combination.

***MRDC-Parameters* information element**

-- ASN1START

-- TAG-MRDC-PARAMETERS-START

MRDC-Parameters ::= SEQUENCE {

singleUL-Transmission ENUMERATED {supported} OPTIONAL,

dynamicPowerSharingENDC ENUMERATED {supported} OPTIONAL,

tdm-Pattern ENUMERATED {supported} OPTIONAL,

ul-SharingEUTRA-NR ENUMERATED {tdm, fdm, both} OPTIONAL,

ul-SwitchingTimeEUTRA-NR ENUMERATED {type1, type2} OPTIONAL,

simultaneousRxTxInterBandENDC ENUMERATED {supported} OPTIONAL,

asyncIntraBandENDC ENUMERATED {supported} OPTIONAL,

...,

[[

dualPA-Architecture ENUMERATED {supported} OPTIONAL,

intraBandENDC-Support ENUMERATED {non-contiguous, both} OPTIONAL,

ul-TimingAlignmentEUTRA-NR ENUMERATED {required} OPTIONAL

]]

}

MRDC-Parameters-v1580 ::= SEQUENCE {

dynamicPowerSharingNEDC ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1590 ::= SEQUENCE {

interBandContiguousMRDC ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1620 ::= SEQUENCE {

maxUplinkDutyCycle-interBandENDC-TDD-PC2-r16 SEQUENCE{

eutra-TDD-Config0-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config1-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config2-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config3-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config4-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config5-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

eutra-TDD-Config6-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL

} OPTIONAL,

-- R1 18-2 Single UL TX operation for TDD PCell in EN-DC

tdm-restrictionTDD-endc-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-2a Single UL TX operation for FDD PCell in EN-DC

tdm-restrictionFDD-endc-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-2b Support of HARQ-offset for SUO case1 in EN-DC with LTE TDD PCell for type 1 UE

singleUL-HARQ-offsetTDD-PCell-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-3 Dual Tx transmission for EN-DC with FDD PCell(TDM pattern for dual Tx UE)

tdm-restrictionDualTX-FDD-endc-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-MRDC-PARAMETERS-STOP

-- ASN1STOP

– *NRDC-Parameters*

The IE *NRDC-Parameters* contains parameters specific to NR-DC, i.e., which are not applicable to NR SA.

***NRDC-Parameters* information element**

-- ASN1START

-- TAG-NRDC-PARAMETERS-START

NRDC-Parameters ::= SEQUENCE {

measAndMobParametersNRDC MeasAndMobParametersMRDC OPTIONAL,

generalParametersNRDC GeneralParametersMRDC-XDD-Diff OPTIONAL,

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

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

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

dummy SEQUENCE {} OPTIONAL

}

NRDC-Parameters-v1570 ::= SEQUENCE {

sfn-SyncNRDC ENUMERATED {supported} OPTIONAL

}

NRDC-Parameters-v1610 ::= SEQUENCE {

measAndMobParametersNRDC-v1610 MeasAndMobParametersMRDC-v1610 OPTIONAL

}

-- TAG-NRDC-PARAMETERS-STOP

-- ASN1STOP

– *OLPC-SRS-Pos*

The IE *OLPC-SRS-Pos* is used to convey OLPC SRS positioning related parameters specific for a certain band.

***OLPC-SRS-Pos* information element**

-- ASN1START

-- TAG-OLPC-SRS-POS-START

OLPC-SRS-Pos-r16 ::= SEQUENCE {

olpc-SRS-PosBasedOnPRS-Serving-r16 ENUMERATED {supported} OPTIONAL,

olpc-SRS-PosBasedOnSSB-Neigh-r16 ENUMERATED {supported} OPTIONAL,

olpc-SRS-PosBasedOnPRS-Neigh-r16 ENUMERATED {supported} OPTIONAL,

maxNumberPathLossEstimatePerServing-r16 ENUMERATED {n1, n4, n8, n16} OPTIONAL

}

--TAG-OLPC-SRS-POS-STOP

-- ASN1STOP

– *PDCP-Parameters*

The IE *PDCP-Parameters* is used to convey capabilities related to PDCP.

***PDCP-Parameters* information element**

-- ASN1START

-- TAG-PDCP-PARAMETERS-START

PDCP-Parameters ::= SEQUENCE {

supportedROHC-Profiles SEQUENCE {

profile0x0000 BOOLEAN,

profile0x0001 BOOLEAN,

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0101 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

maxNumberROHC-ContextSessions ENUMERATED {cs2, cs4, cs8, cs12, cs16, cs24, cs32, cs48, cs64,

cs128, cs256, cs512, cs1024, cs16384, spare2, spare1},

uplinkOnlyROHC-Profiles ENUMERATED {supported} OPTIONAL,

continueROHC-Context ENUMERATED {supported} OPTIONAL,

outOfOrderDelivery ENUMERATED {supported} OPTIONAL,

shortSN ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationSRB ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMCG-OrSCG-DRB ENUMERATED {supported} OPTIONAL,

...,

[[

drb-IAB-r16 ENUMERATED {supported} OPTIONAL,

non-DRB-IAB-r16 ENUMERATED {supported} OPTIONAL,

extendedDiscardTimer-r16 ENUMERATED {supported} OPTIONAL,

continueEHC-Context-r16 ENUMERATED {supported} OPTIONAL,

ehc-r16 ENUMERATED {supported} OPTIONAL,

maxNumberEHC-Contexts-r16 ENUMERATED {cs2, cs4, cs8, cs16, cs32, cs64, cs128, cs256, cs512,

cs1024, cs2048, cs4096, cs8192, cs16384, cs32768, cs65536} OPTIONAL,

jointEHC-ROHC-Config-r16 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMoreThanTwoRLC-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-PDCP-PARAMETERS-STOP

-- ASN1STOP

– *PDCP-ParametersMRDC*

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

***PDCP-ParametersMRDC* information element**

-- ASN1START

-- TAG-PDCP-PARAMETERSMRDC-START

PDCP-ParametersMRDC ::= SEQUENCE {

pdcp-DuplicationSplitSRB ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationSplitDRB ENUMERATED {supported} OPTIONAL

}

PDCP-ParametersMRDC-v1610 ::= SEQUENCE {

scg-DRB-NR-IAB-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-PDCP-PARAMETERSMRDC-STOP

-- ASN1STOP

– *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

]]

}

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

]]

}

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-ParametersMRDC*

The IE *Phy-ParametersMRDC* is used to convey physical layer capabilities for MR-DC.

***Phy-ParametersMRDC* information element**

-- ASN1START

-- TAG-PHY-PARAMETERSMRDC-START

Phy-ParametersMRDC ::= SEQUENCE {

naics-Capability-List SEQUENCE (SIZE (1..maxNrofNAICS-Entries)) OF NAICS-Capability-Entry OPTIONAL,

...,

[[

spCellPlacement CarrierAggregationVariant OPTIONAL

]],

[[

-- R1 18-3b: Semi-statically configured LTE UL transmissions in all UL subframes not limited to tdm-pattern in case of TDD PCell

tdd-PCellUL-TX-AllUL-Subframe-r16 ENUMERATED {supported} OPTIONAL,

-- R1 18-3a: Semi-statically configured LTE UL transmissions in all UL subframes not limited to tdm-pattern in case of FDD PCell

fdd-PCellUL-TX-AllUL-Subframe-r16 ENUMERATED {supported} OPTIONAL

]]

}

NAICS-Capability-Entry ::= SEQUENCE {

numberOfNAICS-CapableCC INTEGER(1..5),

numberOfAggregatedPRB ENUMERATED {n50, n75, n100, n125, n150, n175, n200, n225,

n250, n275, n300, n350, n400, n450, n500, spare},

...

}

-- TAG-PHY-PARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| ***PHY-ParametersMRDC* field descriptions** |
| ***naics-Capability-List***  Indicates that UE in MR-DC supports NAICS as defined in TS 36.331 [10]. |

*– PowSav-Parameters*

The IE *PowSav-Parameters* is used to convey the capabilities supported by the UE for the power saving preferences.

***PowSav-Parameters* information element**

-- ASN1START

-- TAG-POWSAV-PARAMETERS-START

PowSav-Parameters-r16 ::= SEQUENCE {

powSav-ParametersCommon-r16 PowSav-ParametersCommon-r16 OPTIONAL,

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

...

}

PowSav-ParametersCommon-r16 ::= SEQUENCE {

drx-Preference-r16 ENUMERATED {supported} OPTIONAL,

maxCC-Preference-r16 ENUMERATED {supported} OPTIONAL,

releasePreference-r16 ENUMERATED {supported} OPTIONAL,

-- R1 19-4a: UE assistance information

minSchedulingOffsetPreference-r16 ENUMERATED {supported} OPTIONAL,

...

}

PowSav-ParametersFRX-Diff-r16 ::= SEQUENCE {

maxBW-Preference-r16 ENUMERATED {supported} OPTIONAL,

maxMIMO-LayerPreference-r16 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-POWSAV-PARAMETERS-STOP

-- ASN1STOP

– *ProcessingParameters*

The IE *ProcessingParameters* is used to indicate PDSCH/PUSCH processing capabilities supported by the UE.

***ProcessingParameters* information element**

-- ASN1START

-- TAG-PROCESSINGPARAMETERS-START

ProcessingParameters ::= SEQUENCE {

fallback ENUMERATED {sc, cap1-only},

differentTB-PerSlot SEQUENCE {

upto1 NumberOfCarriers OPTIONAL,

upto2 NumberOfCarriers OPTIONAL,

upto4 NumberOfCarriers OPTIONAL,

upto7 NumberOfCarriers OPTIONAL

} OPTIONAL

}

NumberOfCarriers ::= INTEGER (1..16)

-- TAG-PROCESSINGPARAMETERS-STOP

-- ASN1STOP

– *RAT-Type*

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

***RAT-Type* information element**

-- ASN1START

-- TAG-RAT-TYPE-START

RAT-Type ::= ENUMERATED {nr, eutra-nr, eutra, utra-fdd-v1610, ...}

-- TAG-RAT-TYPE-STOP

-- ASN1STOP

– *RF-Parameters*

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

***RF-Parameters* information element**

-- ASN1START

-- TAG-RF-PARAMETERS-START

RF-Parameters ::= SEQUENCE {

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

supportedBandCombinationList BandCombinationList OPTIONAL,

appliedFreqBandListFilter FreqBandList OPTIONAL,

...,

[[

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-v16xy BandCombinationList-v16xy OPTIONAL,

supportedBandCombinationListSidelinkEUTRA-NR-v16xy BandCombinationListSidelinkEUTRA-NR-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

]]

}

-- 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]. |
| ***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

]]

}

-- 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. |

– *RLC-Parameters*

The IE *RLC-Parameters* is used to convey capabilities related to RLC.

***RLC-Parameters* information element**

-- ASN1START

-- TAG-RLC-PARAMETERS-START

RLC-Parameters ::= SEQUENCE {

am-WithShortSN ENUMERATED {supported} OPTIONAL,

um-WithShortSN ENUMERATED {supported} OPTIONAL,

um-WithLongSN ENUMERATED {supported} OPTIONAL,

...,

[[

extendedT-PollRetransmit-r16 ENUMERATED {supported} OPTIONAL,

extendedT-StatusProhibit-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-RLC-PARAMETERS-STOP

-- ASN1STOP

– *SDAP-Parameters*

The IE *SDAP-Parameters* is used to convey capabilities related to SDAP.

***SDAP-Parameters* information element**

-- ASN1START

-- TAG-SDAP-PARAMETERS-START

SDAP-Parameters ::= SEQUENCE {

as-ReflectiveQoS ENUMERATED {true} OPTIONAL,

...,

[[

sdap-QOS-IAB-r16 ENUMERATED {supported} OPTIONAL,

sdapHeaderIAB-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-SDAP-PARAMETERS-STOP

-- ASN1STOP

– *SidelinkParameters*

The IE *SidelinkParameters* is used to convey capabilities related to NR and E-UTRA sidelink communications.

***SidelinkParameters* information element**

-- ASN1START

-- TAG-SIDELINKPARAMETERS-START

SidelinkParameters-r16 ::= SEQUENCE {

sidelinkParametersNR-r16 SidelinkParametersNR-r16 OPTIONAL,

sidelinkParametersEUTRA-r16 SidelinkParametersEUTRA-r16 OPTIONAL

}

SidelinkParametersNR-r16 ::= SEQUENCE {

rlc-ParametersSidelink-r16 RLC-ParametersSidelink-r16 OPTIONAL,

mac-ParametersSidelink-r16 MAC-ParametersSidelink-r16 OPTIONAL,

fdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

tdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

supportedBandListSidelink-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelink-r16 OPTIONAL,

...

}

SidelinkParametersEUTRA-r16 ::= SEQUENCE {

sl-ParametersEUTRA1-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA2-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA3-r16 OCTET STRING OPTIONAL,

supportedBandListSidelinkEUTRA-r16 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF BandSidelinkEUTRA-r16 OPTIONAL,

...

}

RLC-ParametersSidelink-r16 ::= SEQUENCE {

am-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

um-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

MAC-ParametersSidelink-r16 ::= SEQUENCE {

mac-ParametersSidelinkCommon-r16 MAC-ParametersSidelinkCommon-r16 OPTIONAL,

mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL,

...

}

UE-SidelinkCapabilityAddXDD-Mode-r16 ::= SEQUENCE {

mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL

}

MAC-ParametersSidelinkCommon-r16 ::= SEQUENCE {

lcp-RestrictionSidelink-r16 ENUMERATED {supported} OPTIONAL,

multipleConfiguredGrantsSidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

MAC-ParametersSidelinkXDD-Diff-r16 ::= SEQUENCE {

multipleSR-ConfigurationsSidelink-r16 ENUMERATED {supported} OPTIONAL,

logicalChannelSR-DelayTimerSidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

BandSidelinkEUTRA-r16 ::= SEQUENCE {

freqBandSidelinkEUTRA-r16 FreqBandIndicatorEUTRA,

-- R1 15-7: Transmitting LTE sidelink mode 3 scheduled by NR Uu

gnb-ScheduledMode3SidelinkEUTRA-r16 SEQUENCE {

gnb-ScheduledMode3DelaySidelinkEUTRA-r16 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1,

ms1dot25, ms1dot5, ms1dot75, ms2, ms2dot5, ms3, ms4,

ms5, ms6, ms8, ms10, ms20}

} OPTIONAL,

-- R1 15-9: Transmitting LTE sidelink mode 4 configured by NR Uu

gnb-ScheduledMode4SidelinkEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

BandSidelink-r16 ::= SEQUENCE {

freqBandSidelink-r16 FreqBandIndicatorNR,

--15-1

sl-Reception-r16 SEQUENCE {

harq-RxProcessSidelink-r16 ENUMERATED {n16, n24, n32, n48, n64},

pscch-RxSidelink-r16 ENUMERATED {value1, value2},

scs-CP-PatternRxSidelink-r16 CHOICE {

fr1-r16 SEQUENCE {

scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r16 SEQUENCE {

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

}

} OPTIONAL,

extendedCP-RxSidelink-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-2

sl-TransmissionMode1-r16 SEQUENCE {

harq-TxProcessModeOneSidelink-r16 ENUMERATED {n8, n16},

scs-CP-PatternTxSidelinkModeOne-r16 CHOICE {

fr1-r16 SEQUENCE {

scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r16 SEQUENCE {

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

}

},

extendedCP-TxSidelink-r16 ENUMERATED {supported} OPTIONAL,

harq-ReportOnPUCCH-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-4

sync-Sidelink-r16 SEQUENCE {

gNB-Sync-r16 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r16 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNSS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-10

sl-Tx-256QAM-r16 ENUMERATED {supported} OPTIONAL,

--15-11

psfch-FormatZeroSidelink-r16 SEQUENCE {

psfch-RxNumber ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64},

psfch-TxNumber ENUMERATED {n4, n8, n16}

} OPTIONAL,

--15-12

lowSE-64QAM-MCS-TableSidelink-r16 ENUMERATED {supported} OPTIONAL,

--15-15

enb-sync-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

...,

[[

--15-3

sl-TransmissionMode2-r16 SEQUENCE {

harq-TxProcessModeTwoSidelink-r16 ENUMERATED {n8, n16},

scs-CP-PatternTxSidelinkModeTwo-r16 ENUMERATED {supported} OPTIONAL,

dl-openLoopPC-Sidelink-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-5

congestionControlSidelink-r16 SEQUENCE {

cbr-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

cbr-CR-TimeLimitSidelink-r16 ENUMERATED {time1, time2}

} OPTIONAL,

--15-22

fewerSymbolSlotSidelink-r16 ENUMERATED {supported} OPTIONAL,

--15-23

sl-openLoopPC-RSRP-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

--13-1

sl-Rx-256QAM-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-SIDELINKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| ***SidelinkParametersEUTRA* field descriptions** |
| ***sl-ParametersEUTRA1, sl-ParametersEUTRA2, sl-ParametersEUTRA3***  This field includes IE of *SL-Parameters-v1430* (where *v2x-eNB-Scheduled-r14* and *V2X-SupportedBandCombination-r14* shall not be included), *SL-Parameters-v1530* (where *V2X-SupportedBandCombination-r1530* shall not be included) and *SL-Parameters-v1540* respectively defined in 36.331 [10]. It is used for reporting the per-UE capability for V2X sidelink communication. |

– *SON-Parameters*

The IE *SON-Parameters* contains SON related parameters.

***SON-Parameters* information element**

-- ASN1START

-- TAG-SON-PARAMETERS-START

SON-Parameters-r16 ::= SEQUENCE {

rach-Report-r16 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-SON-PARAMETERS-STOP

-- ASN1STOP

– *SpatialRelationsSRS-Pos*

The IE *SpatialRelationsSRS-Pos* is used to convey spatial relation for SRS for positioning related parameters.

***SpatialRelationsSRS-Pos* information element**

-- ASN1START

-- TAG-SPATIALRELATIONSSRS-POS-START

SpatialRelationsSRS-Pos-r16 ::= SEQUENCE {

spatialRelation-SRS-PosBasedOnSSB-Serving-r16 ENUMERATED {supported} OPTIONAL,

spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16 ENUMERATED {supported} OPTIONAL,

spatialRelation-SRS-PosBasedOnPRS-Serving-r16 ENUMERATED {supported} OPTIONAL,

spatialRelation-SRS-PosBasedOnSRS-r16 ENUMERATED {supported} OPTIONAL,

spatialRelation-SRS-PosBasedOnSSB-Neigh-r16 ENUMERATED {supported} OPTIONAL,

spatialRelation-SRS-PosBasedOnPRS-Neigh-r16 ENUMERATED {supported} OPTIONAL

}

--TAG-SPATIALRELATIONSSRS-POS-STOP

-- ASN1STOP

– *SRS-SwitchingTimeNR*

The IE *SRS-SwitchingTimeNR* is used to indicate the SRS carrier switching time supported by the UE for one NR band pair.

***SRS-SwitchingTimeNR information element***

-- ASN1START

-- TAG-SRS-SWITCHINGTIMENR-START

SRS-SwitchingTimeNR ::= SEQUENCE {

switchingTimeDL ENUMERATED {n0us, n30us, n100us, n140us, n200us, n300us, n500us, n900us} OPTIONAL,

switchingTimeUL ENUMERATED {n0us, n30us, n100us, n140us, n200us, n300us, n500us, n900us} OPTIONAL

}

-- TAG-SRS-SWITCHINGTIMENR-STOP

-- ASN1STOP

– *SRS-SwitchingTimeEUTRA*

The IE *SRS-SwitchingTimeEUTRA* is used to indicate the SRS carrier switching time supported by the UE for one E-UTRA band pair.

***SRS-SwitchingTimeEUTRA information element***

-- ASN1START

-- TAG-SRS-SWITCHINGTIMEEUTRA-START

SRS-SwitchingTimeEUTRA ::= SEQUENCE {

switchingTimeDL ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3, n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5, n7}

OPTIONAL,

switchingTimeUL ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3, n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5, n7}

OPTIONAL

}

-- TAG-SRS-SWITCHINGTIMEEUTRA-STOP

-- ASN1STOP

– *SupportedBandwidth*

The IE *SupportedBandwidth* is used to indicate the maximum channel bandwidth supported by the UE on one carrier of a band of a band combination.

***SupportedBandwidth* information element**

-- ASN1START

-- TAG-SUPPORTEDBANDWIDTH-START

SupportedBandwidth ::= CHOICE {

fr1 ENUMERATED {mhz5, mhz10, mhz15, mhz20, mhz25, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100},

fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

}

-- TAG-SUPPORTEDBANDWIDTH-STOP

-- ASN1STOP

– *UE-BasedPerfMeas-Parameters*

The IE *UE-BasedPerfMeas-Parameters* contains UE-based performance measurement parameters.

***UE-BasedPerfMeas-Parameters* information element**

-- ASN1START

-- TAG-UE-BASEDPERFMEAS-PARAMETERS-START

UE-BasedPerfMeas-Parameters-r16 ::= SEQUENCE {

barometerMeasReport-r16 ENUMERATED {supported} OPTIONAL,

immMeasBT-r16 ENUMERATED {supported} OPTIONAL,

immMeasWLAN-r16 ENUMERATED {supported} OPTIONAL,

loggedMeasBT-r16 ENUMERATED {supported} OPTIONAL,

loggedMeasurements-r16 ENUMERATED {supported} OPTIONAL,

loggedMeasWLAN-r16 ENUMERATED {supported} OPTIONAL,

orientationMeasReport-r16 ENUMERATED {supported} OPTIONAL,

speedMeasReport-r16 ENUMERATED {supported} OPTIONAL,

gnss-Location-r16 ENUMERATED {supported} OPTIONAL,

ulPDCP-Delay-r16 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-UE-BASEDPERFMEAS-PARAMETERS-STOP

-- ASN1STOP

– *UE-CapabilityRAT-ContainerList*

The IE *UE-CapabilityRAT-ContainerList* contains a list of radio access technology specific capability containers.

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

-- ASN1START

-- TAG-UE-CAPABILITYRAT-CONTAINERLIST-START

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

UE-CapabilityRAT-Container ::= SEQUENCE {

rat-Type RAT-Type,

ue-CapabilityRAT-Container OCTET STRING

}

-- TAG-UE-CAPABILITYRAT-CONTAINERLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***UE-CapabilityRAT-ContainerList* field descriptions** |
| ***ue-CapabilityRAT-Container***  Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT:  For *rat-Type* set to *nr*: the encoding of UE capabilities is defined in *UE-NR-Capability*.  For *rat-Type* set to *eutra-nr*: the encoding of UE capabilities is defined in *UE-MRDC-Capability*.  For *rat-Type* set to *eutra*: the encoding of UE capabilities is defined in *UE-EUTRA-Capability* specified in TS 36.331 [10].  For *rat-Type* set to *utra-fdd*: the octet string contains the INTER RAT HANDOVER INFO message defined in TS 25.331 [45]. |

– *UE-CapabilityRAT-RequestList*

The IE *UE-CapabilityRAT-RequestList* is used to request UE capabilities for one or more RATs from the UE.

***UE-CapabilityRAT-RequestList* information element**

-- ASN1START

-- TAG-UE-CAPABILITYRAT-REQUESTLIST-START

UE-CapabilityRAT-RequestList ::= SEQUENCE (SIZE (1..maxRAT-CapabilityContainers)) OF UE-CapabilityRAT-Request

UE-CapabilityRAT-Request ::= SEQUENCE {

rat-Type RAT-Type,

capabilityRequestFilter OCTET STRING OPTIONAL, -- Need N

...

}

-- TAG-UE-CAPABILITYRAT-REQUESTLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***UE-CapabilityRAT-Request* field descriptions** |
| ***capabilityRequestFilter***  Information by which the network requests the UE to filter the UE capabilities.  For *rat-Type* set to *nr* or *eutra-nr*: the encoding of the *capabilityRequestFilter* is defined in *UE-CapabilityRequestFilterNR*.  For *rat-Type* set to *eutra*: the encoding of the *capabilityRequestFilter* is defined by *UECapabilityEnquiry* message defined in TS36.331 [10], in which *RAT-Type* in *UE-CapabilityRequest* includes only '*eutra'*. |
| ***rat-Type***  The RAT type for which the NW requests UE capabilities. |

– *UE-CapabilityRequestFilterCommon*

The IE *UE-CapabilityRequestFilterCommon* is used to request filtered UE capabilities. The filter is common for all capability containers that are requested.

***UE-CapabilityRequestFilterCommon* information element**

-- ASN1START

-- TAG-UE-CAPABILITYREQUESTFILTERCOMMON-START

UE-CapabilityRequestFilterCommon ::= SEQUENCE {

mrdc-Request SEQUENCE {

omitEN-DC ENUMERATED {true} OPTIONAL, -- Need N

includeNR-DC ENUMERATED {true} OPTIONAL, -- Need N

includeNE-DC ENUMERATED {true} OPTIONAL -- Need N

} OPTIONAL, -- Need N

...,

[[

codebookTypeRequest-r16 SEQUENCE {

type1-SinglePanel-r16 ENUMERATED {true} OPTIONAL, -- Need N

type1-MultiPanel-r16 ENUMERATED {true} OPTIONAL, -- Need N

type2-r16 ENUMERATED {true} OPTIONAL, -- Need N

type2-PortSelection-r16 ENUMERATED {true} OPTIONAL -- Need N

} OPTIONAL, -- Need N

uplinkTxSwitchRequest-r16 ENUMERATED {true} OPTIONAL -- Need N

]]

}

-- TAG-UE-CAPABILITYREQUESTFILTERCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| ***UE-CapabilityRequestFilterCommon field descriptions*** |
| ***codebookTypeRequest***  Only if this field is present, the UE includes *SupportedCSI-RS-Resource* supported for the codebook type(s) requested within this field (i.e. type I single/multi-panel, type II and type II port selection) into *codebookVariantsList*, *codebookParametersPerBand* and *codebookParametersPerBC*. If this field is present and none of the codebook types is requested within this field (i.e. empty field), the UE includes *SupportedCSI-RS-Resource* supported for all codebook types into *codebookVariantsList*, *codebookParametersPerBand* and *codebookParametersPerBC*. |
| ***includeNE-DC***  Only if this field is present, the UE supporting NE-DC shall indicate support for NE-DC in band combinations and include feature set combinations which are applicable to NE-DC. Band combinations supporting both NE-DC and (NG)EN-DC shall be included in *supportedBandCombinationList*, band combinations supporting only NE-DC shall be included in *supportedBandCombinationListNEDC-Only*. |
| ***includeNR-DC***  Only if this field is present, the UE supporting NR-DC shall indicate support for NR-DC in band combinations and include feature set combinations which are applicable to NR-DC. |
| ***omitEN-DC***  Only if this field is present, the UE shall omit band combinations and feature set combinations which are only applicable to (NG)EN-DC. |
| ***uplinkTxSwitchRequest***  Only if this field is present, the UE supporting dynamic UL Tx switching shall indicate support for UL Tx switching in band combinations which are applicable to inter-band UL CA, SUL and (NG)EN-DC. |

– *UE-CapabilityRequestFilterNR*

The IE *UE-CapabilityRequestFilterNR* is used to request filtered UE capabilities.

***UE-CapabilityRequestFilterNR* information element**

-- ASN1START

-- TAG-UE-CAPABILITYREQUESTFILTERNR-START

UE-CapabilityRequestFilterNR ::= SEQUENCE {

frequencyBandListFilter FreqBandList OPTIONAL, -- Need N

nonCriticalExtension UE-CapabilityRequestFilterNR-v1540 OPTIONAL

}

UE-CapabilityRequestFilterNR-v1540 ::= SEQUENCE {

srs-SwitchingTimeRequest ENUMERATED {true} OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UE-CAPABILITYREQUESTFILTERNR-STOP

-- ASN1STOP

– *UE-MRDC-Capability*

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

***UE-MRDC-Capability* information element**

-- ASN1START

-- TAG-UE-MRDC-CAPABILITY-START

UE-MRDC-Capability ::= SEQUENCE {

measAndMobParametersMRDC MeasAndMobParametersMRDC OPTIONAL,

phy-ParametersMRDC-v1530 Phy-ParametersMRDC OPTIONAL,

rf-ParametersMRDC RF-ParametersMRDC,

generalParametersMRDC GeneralParametersMRDC-XDD-Diff OPTIONAL,

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

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

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

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

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

pdcp-ParametersMRDC-v1530 PDCP-ParametersMRDC OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-MRDC-Capability-v1560 OPTIONAL

}

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

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

measAndMobParametersMRDC-v1560 MeasAndMobParametersMRDC-v1560 OPTIONAL,

fdd-Add-UE-MRDC-Capabilities-v1560 UE-MRDC-CapabilityAddXDD-Mode-v1560 OPTIONAL,

tdd-Add-UE-MRDC-Capabilities-v1560 UE-MRDC-CapabilityAddXDD-Mode-v1560 OPTIONAL,

nonCriticalExtension UE-MRDC-Capability-v1610 OPTIONAL

}

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

measAndMobParametersMRDC-v1610 MeasAndMobParametersMRDC-v1610 OPTIONAL,

generalParametersMRDC-v1610 GeneralParametersMRDC-v1610 OPTIONAL,

pdcp-ParametersMRDC-v1610 PDCP-ParametersMRDC-v1610 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

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

measAndMobParametersMRDC-XDD-Diff MeasAndMobParametersMRDC-XDD-Diff OPTIONAL,

generalParametersMRDC-XDD-Diff GeneralParametersMRDC-XDD-Diff OPTIONAL

}

UE-MRDC-CapabilityAddXDD-Mode-v1560 ::= SEQUENCE {

measAndMobParametersMRDC-XDD-Diff-v1560 MeasAndMobParametersMRDC-XDD-Diff-v1560 OPTIONAL

}

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

measAndMobParametersMRDC-FRX-Diff MeasAndMobParametersMRDC-FRX-Diff

}

GeneralParametersMRDC-XDD-Diff ::= SEQUENCE {

splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

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

srb3 ENUMERATED {supported} OPTIONAL,

v2x-EUTRA ENUMERATED {supported} OPTIONAL,

...

}

GeneralParametersMRDC-v1610 ::= SEQUENCE {

f1c-OverEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-MRDC-CAPABILITY-STOP

-- ASN1STOP

|  |
| --- |
| ***UE-MRDC-Capability* field descriptions** |
| ***featureSetCombinations***  A list of *FeatureSetCombination*:s for *supportedBandCombinationList* and *supportedBandCombinationListNEDC-Only* in *UE-MRDC-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*

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 OPTIONAL,

nonCriticalExtension UE-NR-Capability-v1530 OPTIONAL

}

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

}

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 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*. |

– *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

extendedRAR-Window-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,

-- R1 10-26a: CSI-RS based RRM for NR-U

csi-RS-RRM-r16 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

}

-- TAG-SHAREDSPECTRUMCHACCESSPARAMSPERBAND-STOP

-- ASN1STOP

6.3.4 Other information elements

– *AbsoluteTimeInfo*

The IE *AbsoluteTimeInfo* indicates an absolute time in a format YY-MM-DD HH:MM:SS and using BCD encoding. The first/ leftmost bit of the bit string contains the most significant bit of the most significant digit of the year and so on.

***AbsoluteTimeInfo* information element**

-- ASN1START

-- TAG-ABSOLUTETIMEINFO-START

AbsoluteTimeInfo-r16 ::= BIT STRING (SIZE (48))

-- TAG-ABSOLUTETIMEINFO-STOP

-- ASN1STOP

– *AreaConfiguration*

The *AreaConfiguration* indicates area for which UE is requested to perform measurement logging. If not configured, measurement logging is not restricted to specific cells or tracking areas but applies as long as the RPLMN is contained in *plmn-IdentityList* stored in *VarLogMeasReport*.

***AreaConfiguration* information element**

-- ASN1START

-- TAG-AREACONFIGURATION-START

AreaConfiguration-r16 ::= SEQUENCE {

areaConfig-r16 AreaConfig-r16,

interFreqTargetList-r16 SEQUENCE(SIZE (1..maxFreq)) OF InterFreqTargetInfo-r16 OPTIONAL -- Need R

}

AreaConfig-r16 ::= CHOICE {

cellGlobalIdList-r16 CellGlobalIdList-r16,

trackingAreaCodeList-r16 TrackingAreaCodeList-r16,

trackingAreaIdentityList-r16 TrackingAreaIdentityList-r16

}

InterFreqTargetInfo-r16 ::= SEQUENCE {

dl-CarrierFreq ARFCN-ValueNR,

cellList SEQUENCE (SIZE (1..32)) OF PhysCellId OPTIONAL

}

CellGlobalIdList-r16 ::= SEQUENCE (SIZE (1..32)) OF CGI-Info-Logging-r16

TrackingAreaCodeList-r16 ::= SEQUENCE (SIZE (1..8)) OF TrackingAreaCode

TrackingAreaIdentityList-r16 ::= SEQUENCE (SIZE (1..8)) OF TrackingAreaIdentity-r16

TrackingAreaIdentity-r16 ::= SEQUENCE {

plmn-Identity-r16 PLMN-Identity,

trackingAreaCode-r16 TrackingAreaCode

}

-- TAG-AREACONFIGURATION-STOP

-- ASN1STOP

| ***AreaConfiguration* field descriptions** |
| --- |
| ***InterFreqTargetInfo***  If configured, it indicates the frequency for which UE is requested to perform measurement logging for neighbour cells. UE should perform measurement logging for the frequency in SIB4 of the current serving cell whose DL-carrierfrequency is included in the InterFreqTargetList. If not configured, the UE should perform measurement logging for all the neighbour cells. |

– *BT-NameList*

The IE *BT-NameList* is used to indicate the names of the Bluetooth beacon which the UE is configured to measure.

***BT-NameList* information element**

-- ASN1START

-- TAG-BTNAMELIST-START

BT-NameList-r16 ::= SEQUENCE (SIZE (1..maxBT-Name-r16)) OF BT-Name-r16

BT-Name-r16 ::= OCTET STRING (SIZE (1..248))

-- TAG-BTNAMELIST-STOP

-- ASN1STOP

| ***BT-NameList* field descriptions** |
| --- |
| ***bt-Name***  If configured, the UE only performs Bluetooth measurements according to the names identified. For each name, it refers to LOCAL NAME defined in Bluetooth specification [51]. |

– *EUTRA-AllowedMeasBandwidth*

The IE *EUTRA-AllowedMeasBandwidth* is used to indicate the maximum allowed measurement bandwidth on a carrier frequency as defined by the parameter Transmission Bandwidth Configuration "NRB" in TS 36.104 [33]. The values *mbw6*, *mbw15*, *mbw25*, *mbw50*, *mbw75*, *mbw100* indicate 6, 15, 25, 50, 75 and 100 resource blocks, respectively.

***EUTRA-AllowedMeasBandwidth* information element**

-- ASN1START

-- TAG-EUTRA-ALLOWEDMEASBANDWIDTH-START

EUTRA-AllowedMeasBandwidth ::= ENUMERATED {mbw6, mbw15, mbw25, mbw50, mbw75, mbw100}

-- TAG-EUTRA-ALLOWEDMEASBANDWIDTH-STOP

-- ASN1STOP

– *EUTRA-MBSFN-SubframeConfigList*

The IE *EUTRA-MBSFN-SubframeConfigList* is used to define an E-UTRA MBSFN subframe pattern (for the purpose of NR rate matching).

***EUTRA-MBSFN-SubframeConfigList* information element**

-- ASN1START

-- TAG-EUTRA-MBSFN-SUBFRAMECONFIGLIST-START

EUTRA-MBSFN-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF EUTRA-MBSFN-SubframeConfig

EUTRA-MBSFN-SubframeConfig ::= SEQUENCE {

radioframeAllocationPeriod ENUMERATED {n1, n2, n4, n8, n16, n32},

radioframeAllocationOffset INTEGER (0..7),

subframeAllocation1 CHOICE {

oneFrame BIT STRING (SIZE(6)),

fourFrames BIT STRING (SIZE(24))

},

subframeAllocation2 CHOICE {

oneFrame BIT STRING (SIZE(2)),

fourFrames BIT STRING (SIZE(8))

} OPTIONAL, -- Need R

...

}

-- TAG-EUTRA-MBSFN-SUBFRAMECONFIGLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***EUTRA-MBSFN-SubframeConfig* field descriptions** |
| ***radioframeAllocationOffset***  Field as defined in *MBSFN-SubframeConfig* in TS 36.331 [10]. |
| ***radioframeAllocationPeriod***  Field as defined in *MBSFN-SubframeConfig* in TS 36.331 [10], where *SFN* refers to the SFN of the NR serving cell. |
| ***subframeAllocation1***  Field as defined in *MBSFN-SubframeConfig* in TS 36.331 [10], where the UE assumes the duplex mode (FDD or TDD) of the NR cell for which the *E-UTRA-MBSFN-SubframeConfig* is provided. |
| ***subframeAllocation2***  Field as defined in *MBSFN-SubframeConfig-v1430* in TS 36.331 [10], where the UE assumes the duplex mode (FDD or TDD) of the NR cell for which the *E-UTRA-MBSFN-SubframeConfig* is provided. |

– *EUTRA-MultiBandInfoList*

The IE *EUTRA-MultiBandInfoList* indicates the list of frequency bands in addition to the band represented by *CarrierFreq* for which cell reselection parameters are common, and a list of *additionalPmax* and *additionalSpectrumEmission*.

***EUTRA-MultiBandInfoList* information element**

-- ASN1START

-- TAG-EUTRA-MULTIBANDINFOLIST-START

EUTRA-MultiBandInfoList ::= SEQUENCE (SIZE (1..maxMultiBands)) OF EUTRA-MultiBandInfo

EUTRA-MultiBandInfo ::= SEQUENCE {

eutra-FreqBandIndicator FreqBandIndicatorEUTRA,

eutra-NS-PmaxList EUTRA-NS-PmaxList OPTIONAL -- Need R

}

-- TAG-EUTRA-MULTIBANDINFOLIST-STOP

-- ASN1STOP

– *EUTRA-NS-PmaxList*

The IE *EUTRA-NS-PmaxList* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, as defined in TS 36.101 [22], table 6.2.4-1 for UEs neither in CE nor BL UEs and TS 36.101 [22], table 6.2.4E-1 for UEs in CE or BL UEs, for a given frequency band.

***EUTRA-NS-PmaxList* information element**

-- ASN1START

-- TAG-EUTRA-NS-PMAXLIST-START

EUTRA-NS-PmaxList ::= SEQUENCE (SIZE (1..maxEUTRA-NS-Pmax)) OF EUTRA-NS-PmaxValue

EUTRA-NS-PmaxValue ::= SEQUENCE {

additionalPmax INTEGER (-30..33) OPTIONAL, -- Need R

additionalSpectrumEmission INTEGER (1..288) OPTIONAL -- Need R

}

-- TAG-EUTRA-NS-PMAXLIST-STOP

-- ASN1STOP

– *EUTRA-PhysCellId*

The IE *EUTRA-PhysCellId* is used to indicate the physical layer identity of the cell, as defined in TS 36.211 [31].

***EUTRA-PhysCellId* information element**

-- ASN1START

-- TAG-EUTRA-PHYSCELLID-START

EUTRA-PhysCellId ::= INTEGER (0..503)

-- TAG-EUTRA-PHYSCELLID-STOP

-- ASN1STOP

– *EUTRA-PhysCellIdRange*

The IE *EUTRA-PhysCellIdRange* is used to encode either a single or a range of physical cell identities. The range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range. For fields comprising multiple occurrences of *EUTRA-PhysCellIdRange*, NW may configure overlapping ranges of physical cell identities.

***EUTRA-PhysCellIdRange* information element**

-- ASN1START

-- TAG-EUTRA-PHYSCELLIDRANGE-START

EUTRA-PhysCellIdRange ::= SEQUENCE {

start EUTRA-PhysCellId,

range ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64, n84, n96,

n128, n168, n252, n504, spare2, spare1} OPTIONAL -- Need N

}

-- TAG-EUTRA-PHYSCELLIDRANGE-STOP

-- ASN1STOP

– *EUTRA-PresenceAntennaPort1*

The IE *EUTRA-PresenceAntennaPort1* is used to indicate whether all the neighbouring cells use Antenna Port 1. When set to *true*, the UE may assume that at least two cell-specific antenna ports are used in all neighbouring cells.

***EUTRA-PresenceAntennaPort1* information element**

-- ASN1START

-- TAG-EUTRA-PRESENCEANTENNAPORT1-START

EUTRA-PresenceAntennaPort1 ::= BOOLEAN

-- TAG-EUTRA-PRESENCEANTENNAPORT1-STOP

-- ASN1STOP

– *EUTRA-Q-OffsetRange*

The IE *EUTRA-Q-OffsetRange* is used to indicate a cell, or frequency specific offset to be applied when evaluating triggering conditions for measurement reporting. The value in dB. Value *dB-24* corresponds to -24 dB, value *dB-22* corresponds to -22 dB and so on.

***EUTRA-Q-OffsetRange* information element**

-- ASN1START

-- TAG-EUTRA-Q-OFFSETRANGE-START

EUTRA-Q-OffsetRange ::= ENUMERATED {

dB-24, dB-22, dB-20, dB-18, dB-16, dB-14,

dB-12, dB-10, dB-8, dB-6, dB-5, dB-4, dB-3,

dB-2, dB-1, dB0, dB1, dB2, dB3, dB4, dB5,

dB6, dB8, dB10, dB12, dB14, dB16, dB18,

dB20, dB22, dB24}

-- TAG-EUTRA-Q-OFFSETRANGE-STOP

-- ASN1STOP

– *IAB-IP-Address*

The IE *IAB-IP-Address* is used to indicate the IP address/prefix.

***IAB-IP-Address* information element**

-- ASN1START

-- TAG-IABIPADDRESS-START

IAB-IP-Address-r16 ::= CHOICE {

iPv4-Address-r16 BIT STRING (SIZE(32)),

iPv6-Address-r16 BIT STRING (SIZE(128)),

iPv6-Prefix-r16 BIT STRING (SIZE(64)),

...

}

-- TAG-IABIPADDRESS-STOP

-- ASN1STOP

|  |
| --- |
| ***IAB-IP-Address* field descriptions** |
| ***iPv4-Address***  This field is used to provide the allocated IPv4 address. |
| ***iPv6-Address***  This field is used to provide the allocated IPv6 address. |
| ***iPv6-Prefix***  This field is used to provide the allocated IPv6 prefix. |

– *IAB-IP-AddressIndex*

The IE *IAB-IP-AddressIndex* is used to identify a configuration of an IP address.

***IAB-IP-AddressIndex* information element**

-- ASN1START

-- TAG-IABIPADDRESSINDEX-START

IAB-IP-AddressIndex-r16 ::= INTEGER (1..maxIAB-IP-Address-r16)

-- TAG-IABIPADDRESSINDEX-STOP

-- ASN1STOP

– *IAB-IP-Usage*

The IE *IAB-IP-Usage* is used to indicate the usage of the assigned IP address/prefix.

***IAB-IP-Usage* information element**

-- ASN1START

-- TAG-IAB-IP-USAGE-START

IAB-IP-Usage-r16 ::= ENUMERATED {f1-c, f1-U, non-F1, spare}

-- TAG-IAB-IP-USAGE-STOP

-- ASN1STOP

– *LoggingDuration*

The *LoggingDuration* indicates the duration for which UE is requested to perform measurement logging. Value min10 corresponds to 10 minutes, value min20 corresponds to 20 minutes and so on.

***LoggingDuration* information element**

-- ASN1START

-- TAG-LOGGINGDURATION-START

LoggingDuration-r16 ::= ENUMERATED {

min10, min20, min40, min60, min90, min120, spare2, spare1}

-- TAG-LOGGINGDURATION-STOP

-- ASN1STOP

– *LoggingInterval*

The *LoggingInterval* indicates the periodicity for logging measurement results. Value ms1280 corresponds to 1.28s, value ms2560 corresponds to 2.56s and so on. Value infinity means it is equal to the configured value of the *LoggingDuration* IE.

***LoggingInterval* information element**

-- ASN1START

-- TAG-LOGGINGINTERVAL-START

LoggingInterval-r16 ::= ENUMERATED {

ms320, ms640, ms1280, ms2560, ms5120, ms10240, ms20480,

ms30720, ms40960, ms61440 , infinity}

-- TAG-LOGGINGINTERVAL-STOP

-- ASN1STOP

– *LogMeasResultListBT*

The IE *LogMeasResultListBT* covers measured results for Bluetooth.

***LogMeasResultListBT* information element**

-- ASN1START

-- TAG-LOGMEASRESULTLISTBT-START

LogMeasResultListBT-r16 ::= SEQUENCE (SIZE (1..maxBT-IdReport-r16)) OF LogMeasResultBT-r16

LogMeasResultBT-r16 ::= SEQUENCE {

bt-Addr-r16 BIT STRING (SIZE (48)),

rssi-BT-r16 INTEGER (-128..127) OPTIONAL,

...

}

-- TAG-LOGMEASRESULTLISTBT-STOP

-- ASN1STOP

| ***LogMeasResultListBT* field descriptions** |
| --- |
| ***bt-Addr***  This field indicates the Bluetooth public address of the Bluetooth beacon as defined in TS 37.355 [49]. |
| ***rssi-BT***  This field provides the beacon received signal strength indicator (RSSI) in dBm as defined in TS 37.355 [49]. |

– *LogMeasResultListWLAN*

The IE *LogMeasResultListWLAN* covers measured results for WLAN.

***LogMeasResultListWLAN* information element**

-- ASN1START

-- TAG-LOGMEASRESULTLISTWLAN-START

LogMeasResultListWLAN-r16 ::= SEQUENCE (SIZE (1..maxWLAN-Id-Report-r16)) OF LogMeasResultWLAN-r16

LogMeasResultWLAN-r16 ::= SEQUENCE {

wlan-Identifiers-r16 WLAN-Identifiers-r16,

rssiWLAN-r16 WLAN-RSSI-Range-r16 OPTIONAL,

rtt-WLAN-r16 WLAN-RTT-r16 OPTIONAL,

...

}

WLAN-Identifiers-r16 ::= SEQUENCE {

ssid-r16 OCTET STRING (SIZE (1..32)) OPTIONAL,

bssid-r16 OCTET STRING (SIZE (6)) OPTIONAL,

hessid-r16 OCTET STRING (SIZE (6)) OPTIONAL,

...

}

WLAN-RSSI-Range-r16 ::= INTEGER(0..141)

WLAN-RTT-r16 ::= SEQUENCE {

rttValue-r16 INTEGER (0..16777215),

rttUnits-r16 ENUMERATED {

microseconds,

hundredsofnanoseconds,

tensofnanoseconds,

nanoseconds,

tenthsofnanoseconds,

...},

rttAccuracy-r16 INTEGER (0..255) OPTIONAL,

...

}

-- ASN1STOP

-- TAG-LOGMEASRESULTLISTWLAN-STOP

| ***LogMeasResultListWLAN* field descriptions** |
| --- |
| ***Bssid***  Basic Service Set Identifier (BSSID) defined in IEEE 802.11-2012 [50]. |
| ***Hessid***  Homogenous Extended Service Set Identifier (HESSID) defined in IEEE 802.11-2012 [50]. |
| ***rssiWLAN***  Measured WLAN RSSI result in dBm. The IE WLAN-RSSI-Range specifies the value range used in WLAN RSSI measurements and thresholds. Integer value for WLAN RSSI measurements is according to mapping table in TS 36.133 [40]. Value 0 corresponds to –infinity, value 1 to -100dBm, value 2 to -99dBm, and so on (i.e. in steps of 1dBm) until value 140, which corresponds to 39dBm, while value 141 corresponds to +infinity. |
| ***rtt-WLAN***  This field provides the measured roundtrip time between the target device and WLAN AP and optionally the accuracy expressed as the standard deviation of the delay. Units for each of these are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 37.355 [49]. |
| ***rttValue***  This field specifies the Round Trip Time (RTT) measurement between the target device and WLAN AP in units given by the field rttUnits as defined in TS 37.355 [49]. |
| ***rttUnits***  This field specifies the Units for the fields rttValue and rttAccuracy. The available Units are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 37.355 [49]. |
| ***rttAccuracy***  This field provides the estimated accuracy of the provided rttValue expressed as the standard deviation in units given by the field rttUnits as defined in TS 37.355 [49]. |
| ***Ssid***  Service Set Identifier (SSID) defined in IEEE 802.11-2012 [50]. |
| ***Wlan-Identifiers***  Indicates the WLAN parameters used for identification of the WLAN for which the measurement results are applicable. |

– *OtherConfig*

The IE *OtherConfig* contains configuration related to miscellaneous other configurations.

***OtherConfig* information element**

-- ASN1START

-- TAG-OTHERCONFIG-START

OtherConfig ::= SEQUENCE {

delayBudgetReportingConfig CHOICE{

release NULL,

setup SEQUENCE{

delayBudgetReportingProhibitTimer ENUMERATED {s0, s0dot4, s0dot8, s1dot6, s3, s6, s12, s30}

}

} OPTIONAL -- Need M

}

OtherConfig-v1540 ::= SEQUENCE {

overheatingAssistanceConfig SetupRelease {OverheatingAssistanceConfig} OPTIONAL, -- Need M

...

}

CandidateServingFreqListNR-r16 ::= SEQUENCE (SIZE (1..maxFreqIDC-r16)) OF ARFCN-ValueNR

OtherConfig-v1610 ::= SEQUENCE {

idc-AssistanceConfig-r16 SetupRelease {IDC-AssistanceConfig-r16} OPTIONAL, -- Need M

drx-PreferenceConfig-r16 SetupRelease {DRX-PreferenceConfig-r16} OPTIONAL, -- Need M

maxBW-PreferenceConfig-r16 SetupRelease {MaxBW-PreferenceConfig-r16} OPTIONAL, -- Need M

maxCC-PreferenceConfig-r16 SetupRelease {MaxCC-PreferenceConfig-r16} OPTIONAL, -- Need M

maxMIMO-LayerPreferenceConfig-r16 SetupRelease {MaxMIMO-LayerPreferenceConfig-r16} OPTIONAL, -- Need M

minSchedulingOffsetPreferenceConfig-r16 SetupRelease {MinSchedulingOffsetPreferenceConfig-r16} OPTIONAL, -- Need M

releasePreferenceConfig-r16 SetupRelease {ReleasePreferenceConfig-r16} OPTIONAL, -- Need M

referenceTimePreferenceReporting-r16 ENUMERATED {true} OPTIONAL, -- Need R

btNameList-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

wlanNameList-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

sensorNameList-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL, -- Need M

obtainCommonLocation-r16 ENUMERATED {true} OPTIONAL, -- Need R

sl-AssistanceConfigNR-r16 ENUMERATED{true} OPTIONAL -- Need R

}

OverheatingAssistanceConfig ::= SEQUENCE {

overheatingIndicationProhibitTimer ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30,

s60, s90, s120, s300, s600, spare3, spare2, spare1}

}

IDC-AssistanceConfig-r16 ::= SEQUENCE {

candidateServingFreqListNR-r16 CandidateServingFreqListNR-r16 OPTIONAL, -- Need R

...

}

DRX-PreferenceConfig-r16 ::= SEQUENCE {

drx-PreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, spare2, spare1}

}

MaxBW-PreferenceConfig-r16 ::= SEQUENCE {

maxBW-PreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, spare2, spare1}

}

MaxCC-PreferenceConfig-r16 ::= SEQUENCE {

maxCC-PreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, spare2, spare1}

}

MaxMIMO-LayerPreferenceConfig-r16 ::= SEQUENCE {

maxMIMO-LayerPreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, spare2, spare1}

}

MinSchedulingOffsetPreferenceConfig-r16 ::= SEQUENCE {

minSchedulingOffsetPreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, spare2, spare1}

}

ReleasePreferenceConfig-r16 ::= SEQUENCE {

releasePreferenceProhibitTimer-r16 ENUMERATED {

s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

s8, s9, s10, s20, s30, infinity, spare1},

connectedReporting ENUMERATED {true} OPTIONAL -- Need R

}

-- TAG-OTHERCONFIG-STOP

-- ASN1STOP

| ***OtherConfig* field descriptions** |
| --- |
| ***candidateServingFreqListNR***  Indicates for each candidate NR serving cells, the center frequency around which UE is requested to report IDC issues. |
| ***connectedReporting***  Indicates that the UE can report a preference to remain in RRC\_CONNECTED state following a report to leave RRC\_CONNECTED state. If absent, the UE cannot report a preference to stay in RRC\_CONNECTED state. |
| ***delayBudgetReportingProhibitTimer***  Prohibit timer for delay budget reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot4* means prohibit timer is set to 0.4 seconds, and so on. |
| ***drx-PreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's DRX preferences for power saving. |
| ***drx-PreferenceProhibitTimer***  Prohibit timer for DRX preferences assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***idc-AssistanceConfig***  Configuration for the UE to report assistance information to inform the gNB about UE detected IDC problem. |
| ***maxBW-PreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's preferred bandwidth for power saving. |
| ***maxBW-PreferenceProhibitTimer***  Prohibit timer for preferred bandwidth assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***maxCC-PreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's preferred number of carriers for power saving. |
| ***maxCC-PreferenceProhibitTimer***  Prohibit timer for preferred number of carriers assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***maxMIMO-LayerPreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's preferred number of MIMO layers for power saving. |
| ***maxMIMO-LayerPreferenceProhibitTimer***  Prohibit timer for preferred number of number of MIMO layers assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***minSchedulingOffsetPreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's preferred *minimumSchedulingOffset* value for cross-slot scheduling for power saving. |
| ***minSchedulingOffsetPreferenceProhibitTimer***  Prohibit timer for preferred *minimumSchedulingOffset* assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***obtainCommonLocation***  Requests the UE to attempt to have detailed location information available using GNSS. NR configures the field if *includeCommonLocationInfo* is configured for one or more measurements. |
| ***overheatingAssistanceConfig***  Configuration for the UE to report assistance information to inform the gNB about UE detected internal overheating. |
| ***overheatingIndicationProhibitTimer***  Prohibit timer for overheating assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. |
| ***referenceTimePreferenceReporting***  If present, the field indicates the UE is configured to provide reference time assistance information. |
| ***releasePreferenceConfig***  Configuration for the UE to report assistance information to inform the gNB about the UE's preference to leave RRC\_CONNECTED state. |
| ***releasePreferenceProhibitTimer***  Prohibit timer for release preference assistance information reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot5* means prohibit timer is set to 0.5 seconds, value *s1* means prohibit timer is set to 1 second and so on. Value *infinity* means that once a UE has reported a release preference, the UE cannot report a release preference again during the RRC connection. |
| ***sensorNameList***  Configuration for the UE to report measurements from specific sensors. |
| ***sl-AssistanceConfigNR***  Indicate whether UE is configured to provide configured grant assistance information for NR sidelink communication. |

– *PhysCellIdUTRA-FDD*

The IE *PhysCellIdUTRA-FDD* is used to indicate the physical layer identity of the cell, i.e. the primary scrambling code, as defined in TS 25.331 [45].

***PhysCellIdUTRA-FDD* information element**

-- ASN1START

-- TAG-PHYSCELLIDUTRA-FDD-START

PhysCellIdUTRA-FDD-r16 ::= INTEGER (0..511)

-- TAG-PHYSCELLIDUTRA-FDD-STOP

-- ASN1STOP

– *RRC-TransactionIdentifier*

The IE *RRC-TransactionIdentifier* is used, together with the message type, for the identification of an RRC procedure (transaction).

***RRC-TransactionIdentifier* information element**

-- ASN1START

-- TAG-RRC-TRANSACTIONIDENTIFIER-START

RRC-TransactionIdentifier ::= INTEGER (0..3)

-- TAG-RRC-TRANSACTIONIDENTIFIER-STOP

-- ASN1STOP

– *Sensor-NameList*

The IE *Sensor-NameList* is used to indicate the names of the sensors which the UE is configured to measure.

***Sensor-NameList* information element**

-- ASN1START

-- TAG-SENSORNAMELIST-START

Sensor-NameList-r16 ::= SEQUENCE {

measUncomBarPre-r16 ENUMERATED {true} OPTIONAL, -- Need R

measUeSpeed ENUMERATED {true} OPTIONAL, -- Need R

measUeOrientation ENUMERATED {true} OPTIONAL -- Need R

}

-- TAG-SENSORNAMELIST-STOP

-- ASN1STOP

|  |
| --- |
| ***Sensor-NameList* field descriptions** |
| ***measUncomBarPre***  If configured, the UE reports the uncompensated Barometeric pressure measurement as defined in uncompensatedBarometricPressure-r16. |
| ***measUeSpeed***  If configured, the UE reports the UE speed measurement as defined in TS 37.355 [49]. |
| ***measUeOrientation***  If configured, the UE reports the UE orientation information as defined in TS 37.355 [49]. |

– *TraceReference*

The *TraceReference* contains parameter Trace Reference as defined in TS 32.422 [52].

***TraceReference* information element**

-- ASN1START

-- TAG-TRACEREFERENCE-START

TraceReference-r16 ::= SEQUENCE {

plmn-Identity-r16 PLMN-Identity,

traceId-r16 OCTET STRING (SIZE (3))

}

-- TAG-TRACEREFERENCE-STOP

-- ASN1STOP

– *UE-MeasurementsAvailable-r16*

The IE *UE-MeasurementsAvailable* is used to indicate all relevant available indicators for UE mesurements.

***UE-MeasurementsAvailable* information element**

-- ASN1START

-- TAG-UE-MeasurementsAvailable-START

UE-MeasurementsAvailable-r16 ::= SEQUENCE {

logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

connEstFailInfoAvailable-r16 ENUMERATED {true} OPTIONAL,

rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

...

}

-- TAG-UE-MeasurementsAvailable-STOP

-- ASN1STOP

– *UTRA-FDD-Q-OffsetRange*

The IE *UTRA-FDD-Q-OffsetRange* is used to indicate a frequency specific offset to be applied when evaluating triggering conditions for measurement reporting. The value is in dB. Value *dB-24* corresponds to -24 dB, value *dB-22* corresponds to -22 dB and so on.

***UTRA-FDD-Q-OffsetRange* information element**

-- ASN1START

-- TAG-UTRA-FDD-Q-OFFSETRANGE-START

UTRA-FDD-Q-OffsetRange-r16 ::= ENUMERATED {

dB-24, dB-22, dB-20, dB-18, dB-16, dB-14,

dB-12, dB-10, dB-8, dB-6, dB-5, dB-4, dB-3,

dB-2, dB-1, dB0, dB1, dB2, dB3, dB4, dB5,

dB6, dB8, dB10, dB12, dB14, dB16, dB18,

dB20, dB22, dB24}

-- TAG-UTRA-FDD-Q-OFFSETRANGE-STOP

-- ASN1STOP

– *VisitedCellInfoList*

The IE *VisitedCellInfoList* includes the mobility history information of maximum of 16 most recently visited cells or time spent in any cell selection state and/or camped on any cell state in NR or E-UTRA. The most recently visited cell is stored first in the list. The list includes cells visited in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED states for NR and RRC\_IDLE and RRC\_CONNECTED for E-UTRA.

***VisitedCellInfoList* information element**

-- ASN1START

-- TAG-VISITEDCELLINFOLIST-START

VisitedCellInfoList-r16 ::= SEQUENCE (SIZE (1..maxCellHistory-r16)) OF VisitedCellInfo-r16

VisitedCellInfo-r16 ::= SEQUENCE {

visitedCellId-r16 CHOICE {

nr-CellId-r16 CHOICE {

cgi-Info CGI-Info-Logging-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

eutra-CellId-r16 CHOICE {

cellGlobalId-r16 CGI-InfoEUTRA,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 EUTRA-PhysCellId,

carrierFreq-r16 ARFCN-ValueEUTRA

}

}

} OPTIONAL,

timeSpent-r16 INTEGER (0..4095),

...

}

-- TAG-VISITEDCELLINFOLIST-STOP

-- ASN1STOP

| ***VisitedCellInfoList* field descriptions** |
| --- |
| ***timeSpent***  This field indicates the duration of stay in the cell or in any cell selection state and/or camped on any cell state in NR or E-UTRA approximated to the closest second. If the duration of stay exceeds 4095s, the UE shall set it to 4095s. |
| ***visitedCellId***  This field indicates the visited cell id including NR and E-UTRA cells. |

– *WLAN-NameList*

The IE *WLAN-NameList* is used to indicate the names of the WLAN AP for which the UE is configured to measure.

***WLAN-NameList* information element**

-- ASN1START

-- TAG-WLANNAMELIST-START

WLAN-NameList-r16 ::= SEQUENCE (SIZE (1..maxWLAN-Name-r16)) OF WLAN-Name-r16

WLAN-Name-r16 ::= OCTET STRING (SIZE (1..32))

-- ASN1STOP

-- TAG-WLANNAMELIST-STOP

| ***WLAN-NameList* field descriptions** |
| --- |
| ***WLAN-Name***  If configured, the UE only performs WLAN measurements according to the names identified. For each name, it refers to Service Set Identifier (SSID) defined in IEEE 802.11-2012 [50]. |

6.3.5 Sidelink information elements

– *SL-BWP-Config*

The IE *SL-BWP-Config* is used to configure the UE specific NR sidelink communication on one particular sidelink bandwidth part.

***SL-BWP-Config* information element**

-- ASN1START

-- TAG-SL-BWP-CONFIG-START

SL-BWP-Config-r16 ::= SEQUENCE {

sl-BWP-Id BWP-Id,

sl-BWP-Generic-r16 SL-BWP-Generic-r16 OPTIONAL, -- Need M

sl-BWP-PoolConfig-r16 SL-BWP-PoolConfig-r16 OPTIONAL, -- Need M

...

}

SL-BWP-Generic-r16 ::= SEQUENCE {

sl-BWP-r16 BWP OPTIONAL, -- Need M

sl-LengthSymbols-r16 ENUMERATED {sym7, sym8, sym9, sym10, sym11, sym12, sym13, sym14} OPTIONAL, -- Need M

sl-StartSymbol-r16 ENUMERATED {sym0, sym1, sym2, sym3, sym4, sym5, sym6, sym7} OPTIONAL, -- Need M

sl-PSBCH-Config-r16 SetupRelease {SL-PSBCH-Config-r16} OPTIONAL, -- Need M

sl-TxDirectCurrentLocation-r16 INTEGER (0..3301) OPTIONAL, -- Need M

...

}

-- TAG-SL-BWP-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-BWP-Config* field descriptions** |
| ***sl-BWP-Generic***  This field indicates the generic parameters on the configured sidelink BWP. |
| ***sl-BWP-PoolConfig***  This field indicates the resource pool configurations on the configured sidelink BWP. |

|  |
| --- |
| ***SL-BWP-Generic* field descriptions** |
| ***sl-LengthSymbols***  This field indicates the number of symbols used for sidelink in a slot without SL-SSB. A single value can be (pre)configured per sidelink bandwidth part. |
| ***sl-StartSymbol***  This field indicates the starting symbol used for sidelink in a slot without SL-SSB. A single value can be (pre)configured per sidelink bandwidth part. |
| ***sl-TxDirectCurrentLocation***  The sidelink Tx/Rx Direct Current location for the carrier. Only values in the value range of this field between 0 and 3299, which indicate the subcarrier index within the carrier corresponding to the numerology of the corresponding sidelink BWP and value 3300, which indicates "Outside the carrier" and value 3301, which indicates "Undetermined position within the carrier" are used in this version of the specification. |

– *SL-BWP-ConfigCommon*

The IE *SL-BWP-ConfigCommon* is used to configure the cell-specific configuration information on one particular sidelink bandwidth part.

***SL-BWP-ConfigCommon* information element**

-- ASN1START

-- TAG-SL-BWP-CONFIGCOMMON-START

SL-BWP-ConfigCommon-r16 ::= SEQUENCE {

sl-BWP-Generic-r16 SL-BWP-Generic-r16 OPTIONAL, -- Need R

sl-BWP-PoolConfigCommon-r16 SL-BWP-PoolConfigCommon-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-BWP-CONFIGCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-BWP-ConfigCommon* field descriptions** |
| ***genericParameters***  This field indicates the generic parameters on the configured sidelink BWP. |
| ***sl-BWP-PoolConfigCommon***  This field indicates the resource pool configurations on the configured sidelink BWP. |

– *SL-BWP-PoolConfig*

The IE *SL-BWP-PoolConfig* is used to configure NR sidelink communication resource pool.

***SL-BWP-PoolConfig* information element**

-- ASN1START

-- TAG-SL-BWP-POOLCONFIG-START

SL-BWP-PoolConfig-r16 ::= SEQUENCE {

sl-RxPool-r16 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Cond HO

sl-TxPoolSelectedNormal-r16 SL-TxPoolDedicated-r16 OPTIONAL, -- Need M

sl-TxPoolScheduling-r16 SL-TxPoolDedicated-r16 OPTIONAL, -- Need N

sl-TxPoolExceptional-r16 SL-ResourcePoolConfig-r16 OPTIONAL -- Need M

}

SL-TxPoolDedicated-r16 ::= SEQUENCE {

sl-PoolToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolID-r16 OPTIONAL, -- Need N

sl-PoolToAddModList-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolConfig-r16 OPTIONAL -- Need N

}

SL-ResourcePoolConfig-r16 ::= SEQUENCE {

sl-ResourcePoolID-r16 SL-ResourcePoolID-r16,

sl-ResourcePool-r16 SL-ResourcePool-r16 OPTIONAL -- Need M

}

SL-ResourcePoolID-r16 ::= INTEGER (1..maxNrofPoolID-r16)

-- TAG-SL-BWP-POOLCONFIG-STOP

-- ASN1STOP

| ***SL-BWP-Pool-Config* field descriptions** |
| --- |
| ***sl-RxPool***  Indicates the receiving resource pool on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. If the field is included, it replaces any previous list, i.e. all the entries of the list are replaced and each of the SL-ResourcePool entries is considered to be newly created. |
| ***sl-TxPoolExceptional***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication in exceptional conditions on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |
| ***sl-TxPoolScheduling***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication based on network scheduling on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |
| ***sl-TxPoolSelectedNormal***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication by UE autonomous resource selection on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *HO* | This field is optionally present, need M, in an *RRCReconfiguration* message including *reconfigurationWithSync* for the handover case; otherwise it is absent, Need M. |

– *SL-BWP-PoolConfigCommon*

The IE *SL-BWP-PoolConfigCommon* is used to configure configure the cell-specific NR sidelink communication resource pool.

***SL-BWP-PoolConfigCommon* information element**

-- ASN1START

-- TAG-SL-BWP-POOLCONFIGCOMMON-START

SL-BWP-PoolConfigCommon-r16 ::= SEQUENCE {

sl-RxPool-r16 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Need R

sl-TxPoolSelectedNormal-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolConfig-r16 OPTIONAL, -- Need R

sl-TxPoolExceptional-r16 SL-ResourcePoolConfig-r16 OPTIONAL -- Need R

}

-- TAG-SL-BWP-POOLCONFIGCOMMON-STOP

-- ASN1STOP

– *SL-CBR-PriorityTxConfigList*

The IE *SL-CBR-PriorityTxConfigList* indicates the mapping between PSSCH transmission parameter (such as MCS, PRB number, retransmission number, CR limit) sets by using the indexes of the configurations provided in *sl-CBR-PSSCH-TxConfigList*, CBR ranges by an index to the entry of the CBR range configuration in *sl-CBR-RangeConfigList*, and priority ranges. It also indicates the default PSSCH transmission parameters to be used when CBR measurement results are not available.

***SL-CBR-PriorityTxConfigList* information element**

-- ASN1START

-- TAG-SL-CBR-PRIORITYTXCONFIGLIST-START

SL-CBR-PriorityTxConfigList-r16 ::= SEQUENCE (SIZE (1..8)) OF SL-PriorityTxConfigIndex-r16

SL-PriorityTxConfigIndex-r16 ::= SEQUENCE {

sl-PriorityThreshold-r16 INTEGER (1..8) OPTIONAL, -- Need M

sl-DefaultTxConfigIndex-r16 INTEGER (0..maxCBR-Level-1-r16) OPTIONAL, -- Need M

sl-CBR-ConfigIndex-r16 INTEGER (0..maxCBR-Config-1-r16) OPTIONAL, -- Need M

sl-Tx-ConfigIndexList-r16 SEQUENCE (SIZE (1.. maxCBR-Level-r16)) OF SL-TxConfigIndex-r16 OPTIONAL -- Need M

}

SL-TxConfigIndex-r16 ::= INTEGER (0..maxTxConfig-1-r16)

-- TAG-SL-CBR-PRIORITYTXCONFIGLIST-STOP

-- ASN1STOP

| ***SL-CBR-PriorityTxConfigList* field descriptions** |
| --- |
| ***sl-CBR-ConfigIndex***  Indicates the CBR ranges to be used by an index to the entry of the CBR range configuration in *sl-CBR-RangeConfigList*. |
| ***sl-DefaultTxConfigIndex***  Indicates the PSSCH transmission parameters to be used by the UEs which do not have available CBR measurement results, by means of an index to the corresponding entry in *tx-ConfigIndexList*. Value 0 indicates the first entry in *tx-ConfigIndexList*. The field is ignored if the UE has available CBR measurement results. |
| ***sl-PriorityThreshold***  Indicates the upper bound of priority range which is associated with the configurations in *sl-CBR-ConfigIndex* and in *sl-Tx-ConfigIndexList*. The upper bounds of the priority ranges are configured in ascending order for consecutive entries of *SL-Priority-TxConfigIndex* in *SL-CBR-PriorityTxConfigList*. For the first entry of S*L-Priority-TxConfigIndex*, the lower bound of the priority range is 1. |

– *SL-CBR-CommonTxConfigList*

The IE *SL-CBR-CommonTxConfigList* indicates the list of PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number, CR limit) in *sl-CBR-PSSCH-TxConfigList*, and the list of CBR ranges in *sl-CBR-RangeConfigList*, to configure congestion control to the UE for sidelink communicaition.

***SL-CBR-CommonTxConfigList* information element**

-- ASN1START

-- TAG-SL-CBR-COMMONTXCONFIGLIST-START

SL-CBR-CommonTxConfigList-r16 ::= SEQUENCE {

sl-CBR-RangeConfigList-r16 SEQUENCE (SIZE (1..maxCBR-Config-r16)) OF SL-CBR-LevelsConfig-r16 OPTIONAL, -- Need M

sl-CBR-PSSCH-TxConfigList-r16 SEQUENCE (SIZE (1.. maxTxConfig-r16)) OF SL-CBR-PSSCH-TxConfig-r16 OPTIONAL -- Need M

}

SL-CBR-LevelsConfig-r16 ::= SEQUENCE (SIZE (1..maxCBR-Level-r16)) OF SL-CBR-r16

SL-CBR-PSSCH-TxConfig-r16 ::= SEQUENCE {

sl-CR-Limit-r16 INTEGER(0..10000) OPTIONAL, -- Need M

sl-TxParameters-r16 SL-PSSCH-TxParameters-r16 OPTIONAL -- Need M

}

SL-CBR-r16 ::= INTEGER (0..100)

-- TAG-SL-CBR-COMMONTXCONFIGLIST-STOP

-- ASN1STOP

| ***SL-CBR-CommonTxConfigList* field descriptions** |
| --- |
| ***sl-CBR-RangeConfigList***  Indicates the list of CBR ranges. Each entry of the list indicates in *SL-CBR-LevelsConfig* the upper bound of the CBR range for the respective entry. The upper bounds of the CBR ranges are configured in ascending order for consecutive entries of *sl-CBR-RangeConfigList.* For the first entry of *sl-CBR-RangeConfigList* the lower bound of the CBR range is 0. Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on. |
| ***sl-CR-Limit***  Indicates the maximum limit on the occupancy ratio. Value 0 corresponds to 0, value 1 to 0.0001, value 2 to 0.0002, and so on (i.e. in steps of 0.0001) until value 10000, which corresponds to 1. |
| ***sl-CBR-PSSCH-TxConfigList***  Indicates the list of available PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number and CR limit) configurations. |
| ***sl-TxParameters***  Indicates PSSCH transmission parameters. |

– *SL-ConfigDedicatedNR*

The IE *SL-ConfigDedicatedNR* specifies the dedicated configuration information for NR sidelink communication.

***SL-ConfigDedicatedNR* information element**

-- ASN1START

-- TAG-SL-CONFIGDEDICATEDNR-START

SL-ConfigDedicatedNR-r16 ::= SEQUENCE {

sl-PHY-MAC-RLC-Config-r16 SL-PHY-MAC-RLC-Config-r16 OPTIONAL, -- Need M

sl-RadioBearerToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-Uu-ConfigIndex-r16 OPTIONAL, -- Need N

sl-RadioBearerToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIndex-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-MeasConfigInfo-r16 OPTIONAL, -- Need M

t400-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need M

...

}

SL-DestinationIndex-r16 ::= INTEGER (0..maxNrofSL-Dest-1-r16)

SL-PHY-MAC-RLC-Config-r16::= SEQUENCE {

sl-ScheduledConfig-r16 SetupRelease { SL-ScheduledConfig-r16 } OPTIONAL, -- Need M

sl-UE-SelectedConfig-r16 SetupRelease { SL-UE-SelectedConfig-r16 } OPTIONAL, -- Need M

sl-FreqInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL, -- Need N

sl-FreqInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfig-r16 OPTIONAL, -- Need N

sl-RLC-BearerToReleaseList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfigIndex-r16 OPTIONAL, -- Need N

sl-RLC-BearerToAddModList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need N

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL, -- Need M

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-CSI-SchedulingRequestId-r16 SetupRelease {SchedulingRequestId} OPTIONAL, -- Need M

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL, -- Need R

networkControlledSyncTx-r16 ENUMERATED {on, off} OPTIONAL -- Need M

}

-- TAG-SL-CONFIGDEDICATEDNR-STOP

-- ASN1STOP

| ***SL-ConfigDedicatedNR* field descriptions** |
| --- |
| ***sl-MeasConfigInfoToAddModList***  This field indicates the RSRP measurement configurations for unicast destinations to add and/or modify. |
| ***sl-MeasConfigInfoToReleaseList***  This field indicates the RSRP measurement configurations for unicast destinations to remove. |
| ***sl-RadioBearerToAddModList***  This field indicates one or multiple sidelink radio bearer configurations. |

| ***SL-PHY-MAC-RLC-Config* field descriptions** |
| --- |
| ***NetworkControlledSyncTx***  This field indicates whether the UE shall transmit synchronisation information (i.e. become synchronisation source). Value On indicates the UE to transmit synchronisation information while value Off indicates the UE to not transmit such information. |
| ***sl-maxNumConsecutiveDTX***  This field indicates the maximum number of consecutive HARQ DTX before triggering sidelink RLF. Value n1 corresponds to 1, value n2 corresponds to 2, and so on. |
| ***sl-FreqInfoToAddModList***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies). In this release, only one entry can be configured in the list. |
| ***sl-RLC-BearerToAddModList***  This field indicates one or multiple sidelink RLC bearer configurations. |
| ***sl-ScheduledConfig***  Indicates the configuration for UE to transmit NR sidelink communication based on network scheduling. This field is not configured simultaneously with sl-UE-SelectedConfig. |
| ***sl-UE-SelectedConfig***  Indicates the configuration used for UE autonomous resource selection. This field is not configured simultaneously with *sl-ScheduledConfig*. |
| ***sl-CSI-Acquisition***  Indicates whether CSI reporting is enabled in sidelink unicast. If the field is absent, sidelink CSI reporting is disabled. |
| ***sl-CSI-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for sidelink CSI report MAC CE, as specified in TS 38.321 [3]. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |

– *SL-ConfiguredGrantConfig*

The IE *SL-ConfiguredGrantConfig* specifies the configured grant configuration information for NR sidelink communication.

***SL-ConfiguredGrantConfig* information element**

-- ASN1START

-- TAG-SL-CONFIGUREDGRANTCONFIG-START

SL-ConfiguredGrantConfig-r16 ::= SEQUENCE {

sl-ConfigIndexCG-r16 SL-ConfigIndexCG-r16,

sl-PeriodCG-r16 SL-PeriodCG-r16 OPTIONAL, -- Need M

sl-NrOfHARQ-Processes-r16 INTEGER (1..16) OPTIONAL, -- Need M

sl-HARQ-ProcID-offset-r16 INTEGER (1..16) OPTIONAL, -- Need M

sl-CG-MaxTransNumList-r16 SL-CG-MaxTransNumList-r16 OPTIONAL, -- Need M

rrc-ConfiguredSidelinkGrant-r16 SEQUENCE {

sl-TimeResourceCG-Type1-r16 INTEGER (0..496) OPTIONAL, -- Need M

sl-StartSubchannelCG-Type1-r16 INTEGER (0..26) OPTIONAL, -- Need M

sl-FreqResourceCG-Type1-r16 INTEGER (0..6929) OPTIONAL, -- Need M

sl-TimeOffsetCG-Type1-r16 INTEGER (0..7999) OPTIONAL, -- Need R

sl-N1PUCCH-AN-r16 PUCCH-ResourceId OPTIONAL, -- Need M

sl-PSFCH-ToPUCCH-CG-Type1-r16 INTEGER (0..15) OPTIONAL, -- Need M

sl-ResourcePoolID-r16 SL-ResourcePoolID-r16 OPTIONAL, -- Need M

sl-TimeReferenceSFN-Type1-r16 ENUMERATED {sfn512} OPTIONAL -- Need S

} OPTIONAL, -- Need M

...

}

SL-ConfigIndexCG-r16 ::= INTEGER (1..maxNrofCG-SL-r16)

SL-CG-MaxTransNumList-r16 ::= SEQUENCE (SIZE (1..8)) OF SL-CG-MaxTransNum-r16

SL-CG-MaxTransNum-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-MaxTransNum-r16 INTEGER (1..32)

}

SL-PeriodCG-r16 ::= CHOICE{

sl-PeriodCG1-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000, spare6,

spare5, spare4, spare3, spare2, spare1},

sl-PeriodCG2-r16 INTEGER (1..99)

}

-- TAG-SL-CONFIGUREDGRANTCONFIG-STOP

-- ASN1STOP

| ***SL- ConfiguredGrantConfig* field descriptions** |
| --- |
| ***sl-ConfigIndexCG***  This field indicates the ID to identify configured grant for sidelink. |
| ***sl-CG-MaxTransNumList***  This field indicates the maximum number of times that a TB can be transmitted using the resources provided by the configured grant. *sl-Priority* corresponds to the logical channel priority. |
| ***sl-FreqResourceCG-Type1***  Indicates the frequency resource location of sidelink configured grant type 1. An index giving valid combinations of one or two starting sub-channel and length (joinly encoded) as resource indicator (RIV), as defined in TS 38.214 [19]. |
| ***sl-N1PUCCH-AN***  This field indicates the HARQ resource for PUCCH for SL configured grant type 1 or SL configured type 2. The actual PUCCH-Resource is configured in sl-PUCCH-Config and referred to by its ID. |
| ***sl-NrOfHARQ-Processes***  This field indicates the number of HARQ processes configured for a specific configured grant. It applies for both Type 1 and Type 2. |
| ***sl-PeriodCG***  This field indicates the period of sidelink configured grant in the unit of ms. |
| ***sl-PSFCH-ToPUCCH -CG-Type1***  This field, for configured grant type 1, indicates slot offset between the PSFCH associated with the last PSSCH resource of each period and the PUCCH occasion used for reporting sidelink HARQ. |
| ***sl-ResourcePoolID***  Indicates the resource pool in which the configured sidelink grant Type 1 is applied. |
| ***sl-StartSubchannelCG-Type1***  This field indicates the starting sub-channel of sidelink configured grant Type 1. An index giving valid sub-channel index. |
| ***sl-TimeOffsetCG-Type1***  This field indicates the time offset related to SFN= *sl-TimeReferenceSFN-Type1*, as specified in TS 38.321 [3]. |
| ***sl-TimeReferenceSFN-Type1***  Indicates SFN used for determination of the offset of a resource in time domain. If it is present, the UE uses the closest SFN with the indicated number preceding the reception of the sidelink configured grant configuration Type 1, see TS 38.321 [3], clause 5.8.3. If it is not present, the reference SFN is 0. |
| ***sl-TimeResourceCG-Type1***  This field indicates the time resource location of sidelink configured grant Type 1. An index giving valid combinations of up to two slot positions (jointly encoded) as time resource indicator (TRIV), as defined in TS 38.212 [17]. |

– *SL-DestinationIdentity*

The IE *SL-DestinationIdentity* is used to identify a destination of a NR sidelink communication.

***SL-DestinationIdentity* information element**

-- ASN1START

-- TAG-SL-DESTINATIONIDENTITY-START

SL-DestinationIdentity-r16 ::= BIT STRING (SIZE (24))

-- TAG-SL-DESTINATIONIDENTITY-STOP

-- ASN1STOP

– *SL-FreqConfig*

The IE *SL-FreqConfig* specifies the dedicated configuration information on one particular carrier frequency for NR sidelink communication.

***SL-FreqConfig* information element**

-- ASN1START

-- TAG-SL-FREQCONFIG-START

SL-FreqConfig-r16 ::= SEQUENCE {

sl-Freq-Id-r16 SL-Freq-Id-r16,

sl-SCS-SpecificCarrierList-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

sl-AbsoluteFrequencyPointA-r16 ARFCN-ValueNR OPTIONAL, -- Need M

sl-AbsoluteFrequencySSB-r16 ARFCN-ValueNR OPTIONAL, -- Need R

frequencyShift7p5khzSL-r16 ENUMERATED {true} OPTIONAL, -- Cond V2X-SL-Shared

valueN-r16 INTEGER (-1..1),

sl-BWP-ToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF BWP-Id OPTIONAL, -- Need N

sl-BWP-ToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF SL-BWP-Config-r16 OPTIONAL, -- Need N

sl-SyncConfigList-r16 SL-SyncConfigList-r16 OPTIONAL, -- Need M

sl-SyncPriority-r16 ENUMERATED {gnss, gnbEnb} OPTIONAL -- Need M

}

SL-Freq-Id-r16 ::= INTEGER (1.. maxNrofFreqSL-r16)

-- TAG-SL-FREQCONFIG-STOP

-- ASN1STOP

| ***SL-FreqConfig* field descriptions** |
| --- |
| ***frequencyShift7p5khzSL***  Enable the NR SL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***sl-AbsoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. |
| ***sl-AbsoluteFrequencySSB***  Indicates the frequency location of sidelink SSB. The transmission bandwidth for sidelink SSB is within the bandwidth of this sidelink BWP. |
| ***sl-BWP-ToAddModList***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration is to be added or reconfigured. In this release, only one BWP is allowed to be configured for NR sidelink conmunication. |
| ***sl-BWP-ToReleaseList***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration is to be released. |
| ***sl-Freq-Id***  This field indicates the identity of the SL-FreqConfig configuration. |
| ***sl-SCS-SpecificCarrierList***  A set of UE specific channel bandwidth and location configurations for different subcarrier spacings (numerologies). Defined in relation to Point A. The UE uses the configuration provided in this field only for the purpose of channel bandwidth and location determination. In this release, only one *SCS-SpecificCarrier* is allowed to be configured for NR sidelink conmunication. |
| ***sl-SyncPriority***  This field indicates synchronization priority order, as specified in sub-clause 5.8.6. |
| ***valueN***  Indicate the NR SL transmission with a valueN \*5kHz shift to the LTE raster. (see [TS 38.101-1 [15]], clause X.X.X). |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *V2X-SL-Shared* | This field is mandatory present if the carrier frequency configured for NR sidelink communication is shared by V2X sidelink communication. It is absent, Need R, otherwise. |

– *SL-FreqConfigCommon*

The IE *FreqConfigCommon* specifies the cell-specific configuration information on one particular carrier frequency for NR sidelink communication.

***SL-FreqConfigCommon* information element**

-- ASN1START

-- TAG-SL-FREQCONFIGCOMMON-START

SL-FreqConfigCommon-r16 ::= SEQUENCE {

sl-SCS-SpecificCarrierList-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

sl-AbsoluteFrequencyPointA-r16 ARFCN-ValueNR,

sl-AbsoluteFrequencySSB-r16 ARFCN-ValueNR OPTIONAL, -- Need R

frequencyShift7p5khzSL-r16 ENUMERATED {true} OPTIONAL, -- Cond V2X-SL-Shared

valueN-r16 INTEGER (-1..1),

sl-BWP-List-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF SL-BWP-ConfigCommon-r16 OPTIONAL, -- Need R

sl-SyncPriority-r16 ENUMERATED {gnss, gnbEnb} OPTIONAL, -- Need R

sl-NbAsSync-r16 BOOLEAN OPTIONAL, -- Need R

sl-SyncConfigList-r16 SL-SyncConfigList-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-FREQCONFIGCOMMON-STOP

-- ASN1STOP

| ***SL-FreqConfigCommon* field descriptions** |
| --- |
| ***frequencyShift7p5khzSL***  Enable the NR SL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***sl-AbsoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. |
| ***sl-AbsoluteFrequencySSB***  Indicates the frequency location of sidelink SSB. The transmission bandwidth for sidelink SSB is within the bandwidth of this sidelink BWP. |
| ***sl-BWP-List***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration. In this release, only one BWP is allowed to be configured for NR sidelink conmunication. |
| ***sl-NbAsSync***  This field indicates whether the network can be selected as synchronization reference directly/indirectly only, if *sl-SyncPriority* is set to gnss. If this filed is set to TRUE, the network is enabled to be selected as synchronization reference directly/indirectly. The field is only present in *SidelinkPreconfigNR*. Otherwise it is absent. |
| ***sl-SyncPriority***  This field indicates synchronization priority order, as specified in sub-clause 5.8.6.. |
| ***sl-SyncConfigList***  This field indicates the configuration by which the UE is allowed to receive and transmit synchronisation information for NR sidelink communication. Network configures *sl-SyncConfig* including *txParameters* when configuring UEs to transmit synchronisation information. |
| ***valueN***  Indicate the NR SL transmission with a valueN \*5kHz shift to the LTE raster (see [TS 38.101-1 [15]], clause X.X.X). |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *V2X-SL-Shared* | This field is mandatory present if the carrier frequency configured for NR sidelink communication is shared by V2X sidelink communication. It is absent, Need R, otherwise. |

– *SL-LogicalChannelConfig*

The IE *SL*-*LogicalChannelConfig* is used to configure the sidelink logical channel parameters.

***SL-LogicalChannelConfig* information element**

-- ASN1START

-- TAG-SL-LOGICALCHANNELCONFIG-START

SL-LogicalChannelConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-PrioritisedBitRate-r16 ENUMERATED {kBps0, kBps8, kBps16, kBps32, kBps64, kBps128, kBps256, kBps512,

kBps1024, kBps2048, kBps4096, kBps8192, kBps16384, kBps32768, kBps65536, infinity},

sl-BucketSizeDuration-r16 ENUMERATED {ms5, ms10, ms20, ms50, ms100, ms150, ms300, ms500, ms1000,

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

sl-ConfiguredGrantType1Allowed-r16 ENUMERATED {true} OPTIONAL, -- Need R

sl-HARQ-FeedbackEnabled-r16 ENUMERATED {enabled, disabled } OPTIONAL, -- Need R

sl-AllowedCG-List-r16 SEQUENCE (SIZE (0.. maxNrofCG-SL-r16-1)) OF SL-ConfigIndexCG-r16

OPTIONAL, -- Need R

sl-AllowedSCS-List-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SubcarrierSpacing OPTIONAL, -- Need R

sl-MaxPUSCH-Duration-r16 ENUMERATED {ms0p02, ms0p04, ms0p0625, ms0p125, ms0p25, ms0p5, spare2, spare1}

OPTIONAL, -- Need R

sl-LogicalChannelGroup-r16 INTEGER (0..maxLCG-ID) OPTIONAL, -- Need R

sl-SchedulingRequestId-r16 SchedulingRequestId OPTIONAL, -- Need R

sl-LogicalChannelSR-DelayTimerApplied-r16 BOOLEAN OPTIONAL, -- Need R

...

}

-- TAG-SL-LOGICALCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-LogicalChannelConfig field* descriptions** |
| ***sl-AllowedCG-List***  This restriction applies only when the SL grant is a configured grant. If present, SL MAC SDUs from this logical channel can only be mapped to the indicated configured grant configuration. If the size of the sequence is zero, then UL MAC SDUs from this logical channel cannot be mapped to any configured grant configurations. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any configured grant configurations. Corresponds to "sl-AllowedCG-List" as specified in TS 38.321 [3]. |
| ***sl-AllowedSCS-List***  If present, indicate the numerology of UL-SCH resources that this sidelink logical channel is mapped to, when checking the SR trigger condition. Corresponds to ' sl-AllowedSCS-List' in TS 38.321 [3]. |
| ***sl-BucketSizeDuration***  Value in ms. *ms5* corresponds to 5 ms, value *ms10* corresponds to 10 ms, and so on. |
| ***sl-ConfiguredGrantType1Allowed***  If present, SL MAC SDUs from this sidelink logical channel can be transmitted on a sidelink configured grant type 1. Corresponds to 'sl-configuredGrantType1Allowed' in TS 38.321 [3]. |
| ***sl-HARQ-FeedbackEnabled***  If present, indicate the HARQ feedback enabled/disabled restriction in LCP for this sidelink logical channel. If set to enabled, the sidelink logical channel will be multiplexed only with a logical channel which enabling the HARQ feedback. If set to *disabled*, the sidelink logical channel cannot be multiplexed with a logical channel which enabling the HARQ feedback. Corresponds to 'sl-HARQ-FeedbackEnabled' in TS 38.321 [3]. If this field of at least one sidelink logical channel for the UE is set to enabled, sl-PSFCH-Config should be mandatory present in at least one of the SL-ResourcePool. |
| ***sl-LogicalChannelGroup***  ID of the sidelink logical channel group, as specified in TS 38.321 [3], which the sidelink logical channel belongs to. |
| ***sl-LogicalChannelSR-DelayTimerApplied***  Indicates whether to apply the delay timer for SR transmission for this sidelink logical channel. Set to false if *logicalChannelSR-DelayTimer* is not included in *sl-BSR-Config*. |
| ***sl-MaxPUSCH-Duration***  If present, indicate the maximum PUSCH duration of UL-SCH resources that this sidelink logical channel is mapped to, when checking the SR trigger condition. Corresponds to "sl-MaxPUSCH-Duration" in TS 38.321 [3]. |
| ***sl-PrioritisedBitRate***  Value in kiloBytes/s. Value *kBps0* corresponds to 0 kiloBytes/s, value *kBps8* corresponds to 8 kiloBytes/s, value *kBps16* corresponds to 16 kiloBytes/s, and so on. |
| ***sl-Priority***  Sidelink logical channel priority, as specified in TS 38.321 [3]. |
| ***sl-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for this sidelink logical channel, as specified in TS 38.321 [3]. |

– *SL-MeasConfigCommon*

The IE *SL-MeasConfigCommon* is used to set the cell specific SL RSRP measurement configurations for unicast destionations.

***SL-MeasConfigCommon* information element**

-- ASN1START

-- TAG-SL-MEASCONFIGCOMMON-START

SL-MeasConfigCommon-r16 ::= SEQUENCE {

sl-MeasObjectListCommon-r16 SL-MeasObjectList-r16 OPTIONAL, -- Need R

sl-ReportConfigListCommon-r16 SL-ReportConfigList-r16 OPTIONAL, -- Need R

sl-MeasIdListCommon-r16 SL-MeasIdList-r16 OPTIONAL, -- Need R

sl-QuantityConfigCommon-r16 SL-QuantityConfig-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-MEASCONFIGCOMMON-STOP

-- ASN1STOP

| ***SL-MeasConfigCommon* field descriptions** |
| --- |
| ***sl-MeasIdListCommon***  List of sidelink measurement identities |
| ***sl-MeasObjectListCommon***  List of sidelink measurement objects. |
| ***sl-QuantityConfigCommon***  Indicates the layer 3 filtering coefficient for sidelink measurement. |
| ***sl-ReportConfigListCommon***  List of sidelink measurement reporting configurations. |

– *SL-MeasConfigInfo*

The IE *SL*-*MeasConfigInfo* is used to set RSRP measurement configurations for unicast destinations.

***SL-MeasConfigInfo* information element**

-- ASN1START

-- TAG-SL-MEASCONFIGINFO-START

SL-MeasConfigInfo-r16 ::= SEQUENCE {

sl-DestinationIndex-r16 SL-DestinationIndex-r16,

sl-MeasConfig-r16 SL-MeasConfig-r16,

...

}

SL-MeasConfig-r16 ::= SEQUENCE {

sl-MeasObjectToRemoveList-r16 SL-MeasObjectToRemoveList-r16 OPTIONAL, -- Need N

sl-MeasObjectToAddModList-r16 SL-MeasObjectList-r16 OPTIONAL, -- Need N

sl-ReportConfigToRemoveList-r16 SL-ReportConfigToRemoveList-r16 OPTIONAL, -- Need N

sl-ReportConfigToAddModList-r16 SL-ReportConfigList-r16 OPTIONAL, -- Need N

sl-MeasIdToRemoveList-r16 SL-MeasIdToRemoveList-r16 OPTIONAL, -- Need N

sl-MeasIdToAddModList-r16 SL-MeasIdList-r16 OPTIONAL, -- Need N

sl-QuantityConfig-r16 SL-QuantityConfig-r16 OPTIONAL, -- Need M

...

}

SL-MeasObjectToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ObjectId-r16)) OF SL-MeasObjectId-r16

SL-ReportConfigToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ReportConfigId-r16)) OF SL-ReportConfigId-r16

SL-MeasIdToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-MeasId-r16)) OF SL-MeasId-r16

-- TAG-SL-MEASCONFIGINFO-STOP

-- ASN1STOP

| ***SL-MeasConfigInfo* field descriptions** |
| --- |
| ***sl-MeasIdToAddModList***  List of sidelink measurement identities to add and/or modify. |
| ***sl-MeasIdToRemoveList***  List of sidelink measurement identities to remove. |
| ***sl-MeasObjectToAddModList***  List of sidelink measurement objects to add and/or modify. |
| ***sl-MeasObjectToRemoveList***  List of sidelink measurement objects to remove. |
| ***sl-QuantitiyConfig***  Indicates the layer 3 filtering coefficient for sidelink measurement. |
| ***sl-ReportConfigToAddModList***  List of sidelink measurement reporting configurations to add and/or modify. |
| ***sl-ReportConfigToRemoveList***  List of sidelink measurement reporting configurations to remove. |

– *SL-MeasIdList*

The IE *SL*-*MeasIdList* concerns a list of SL measurement identities to add or modify for a destination, with for each entry the *sl-MeasId*, the associated *sl-MeasObjectId* and the associated *sl-ReportConfigId*.

***SL-MeasIdList* information element**

-- ASN1START

-- TAG-SL-MEASIDLIST-START

SL-MeasIdList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-MeasId-r16)) OF SL-MeasIdInfo-r16

SL-MeasIdInfo-r16 ::= SEQUENCE {

sl-MeasId-r16 SL-MeasId-r16,

sl-MeasObjectId-r16 SL-MeasObjectId-r16,

sl-ReportConfigId-r16 SL-ReportConfigId-r16,

...

}

SL-MeasId-r16 ::= INTEGER (1..maxNrofSL-MeasId-r16)

-- TAG-SL-MEASIDLIST-STOP

-- ASN1STOP

– *SL-MeasObjectList*

The IE *SL*-*MeasObjectList* concerns a list of SL measurement objects to add or modify for a destination.

***SL-MeasObjectList* information element**

-- ASN1START

-- TAG-SL-MEASOBJECTLIST-START

SL-MeasObjectList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ObjectId-r16)) OF SL-MeasObjectInfo-r16

SL-MeasObjectInfo-r16 ::= SEQUENCE {

sl-MeasObjectId-r16 SL-MeasObjectId-r16,

sl-MeasObject-r16 SL-MeasObject-r16,

...

}

SL-MeasObjectId-r16 ::= INTEGER (1..maxNrofSL-ObjectId-r16)

SL-MeasObject-r16 ::= SEQUENCE {

frequencyInfoSL-r16 ARFCN-ValueNR,

...

}

-- TAG-SL-MEASOBJECTLIST-STOP

-- ASN1STOP

| ***SL-MeasObjectList* field descriptions** |
| --- |
| ***sl-MeasObjectId***  It is used to identify a sidelink measurement object configuration. |
| ***sl-MeasObject***  It specifies information applicable for sidelink DMRS measurement. |

– *SL-PDCP-Config*

The IE *SL*-*PDCP-Config* is used to set the configurable PDCP parameters for a sidelink radio bearer.

***SL-PDCP-Config* information element**

-- ASN1START

-- TAG-SL-PDCP-CONFIG-START

SL-PDCP-Config-r16 ::= SEQUENCE {

sl-DiscardTimer-r16 ENUMERATED {ms3, ms10, ms20, ms25, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200,

ms250, ms300, ms500, ms750, ms1500, infinity} OPTIONAL, -- Cond Setup

sl-PDCP-SN-Size-r16 ENUMERATED {len12bits, len18bits} OPTIONAL, -- Cond Setup2

sl-OutOfOrderDelivery ENUMERATED { true } OPTIONAL, -- Need R

...

}

-- TAG-SL-PDCP-CONFIG-STOP

-- ASN1STOP

| ***SL-PDCP-Config* field descriptions** |
| --- |
| ***sl-DiscardTimer***  Value in ms of *discardTimer* specified in TS 38.323 [5]. Value *ms50* corresponds to 50 ms, value *ms100* corresponds to 100 ms and so on. |
| ***sl-OutOfOrderDelivery***  Indicates whether or not outOfOrderDelivery specified in TS 38.323 [5] is configured. This field should be either always present or always absent, after the radio bearer is established. |
| ***sl-PDCP-SN-Size***  PDCP sequence number size for unicast NR sidelink communication, 12 or 18 bits, as specified in TS 38.323 [5]. For groupcast and broadcast NR sidelink communication, only 12 bits is applicable, as specified in 9.1.1.5. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *Setup* | The field is mandatory present in case of sidelink DRB setup via dedicated signaling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, need M. |
| *Setup2* | The field is mandatory present in case of sidelink DRB setup via dedicated signaling and in case of sidelink DRB configuration via system information and pre-configuration for RLC-AM and RLC-UM for unicast NR sidelink communication; otherwise the field is not present, Need M. |

– *SL-PSBCH-Config*

The IE *SL-PSBCH-Config* indicates PSBCH transmission parameters on each sidelink bandwidth part.

***SL-PSBCH-Config* information element**

-- ASN1START

-- TAG-SL-PSBCH-CONFIG-START

SL-PSBCH-Config-r16 ::= SEQUENCE {

dl-P0-PSBCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

dl-Alpha-PSBCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

...

}

-- TAG-SL-PSBCH-CONFIG-STOP

-- ASN1STOP

| ***SL-PSBCH-Config* field descriptions** |
| --- |
| ***dl-Alpha-PSBCH***  Indicates alpha value for DL pathloss based power control for PSBCH. When the field is absent the UE applies the value 1 |
| ***dl-P0-PSBCH***  Indicates P0 value for DL pathloss based power control for PSBCH. If not configured, DL pathloss based power control is disabled for PSBCH. |

– *SL-PSSCH-TxConfigList*

The IE *SL-PSSCH-TxConfigList* indicates PSSCH transmission parameters. When lower layers select parameters from the range indicated in IE *SL-PSSCH-TxConfigList*, the UE considers both configurations in IE *SL-PSSCH-TxConfigList* and the CBR-dependent configurations represented in IE *SL-CBR-PriorityTxConfigList*. Only one IE *SL-PSSCH-TxConfig* is provided per *SL-TypeTxSync*.

***SL-PSSCH-TxConfigList* information element**

-- ASN1START

-- TAG-SL-PSSCH-TXCONFIGLIST-START

SL-PSSCH-TxConfigList-r16 ::= SEQUENCE (SIZE (1..maxPSSCH-TxConfig-r16)) OF SL-PSSCH-TxConfig-r16

SL-PSSCH-TxConfig-r16 ::= SEQUENCE {

sl-TypeTxSync-r16 SL-TypeTxSync-r16 OPTIONAL, -- Need R

sl-ThresUE-Speed-r16 ENUMERATED {kmph60, kmph80, kmph100, kmph120,

kmph140, kmph160, kmph180, kmph200},

sl-ParametersAboveThres-r16 SL-PSSCH-TxParameters-r16,

sl-ParametersBelowThres-r16 SL-PSSCH-TxParameters-r16,

...

}

SL-PSSCH-TxParameters-r16 ::= SEQUENCE {

sl-MinMCS-PSSCH-r16 INTEGER (0..27),

sl-MaxMCS-PSSCH-r16 INTEGER (0..31),

sl-MinSubChannelNumPSSCH-r16 INTEGER (1..27),

sl-MaxSubchannelNumPSSCH-r16 INTEGER (1..27),

sl-MaxTxTransNumPSSCH-r16 INTEGER (1..32),

sl-MaxTxPower-r16 SL-TxPower-r16 OPTIONAL -- Cond CBR

}

-- TAG-SL-PSSCH-TXCONFIGLIST-STOP

-- ASN1STOP

| ***SL-PSSCH-TxConfigList* field descriptions** |
| --- |
| ***sl-MaxTxTransNumPSSCH***  Indicates the maximum transmission number (including new transmission and retransmission) for PSSCH. |
| ***sl-MaxTxPower***  This filed indicates the maximum transmission power for transmission on PSSCH and PSCCH. |
| ***sl-MinMCS-PSSCH, sl-MaxMCS-PSSCH***  This field indicates the minimum and maximum MCS values used for transmissions on PSSCH. |
| ***sl-MinSubChannelNumPSSCH, sl-MaxSubChannelNumPSSCH***  This field indicates the minimum and maximum number of sub-channels which may be used for transmissions on PSSCH. |
| ***sl-TypeTxSync***  This filed indicates the synchronization reference type. For configurations by the eNB/gNB, only gnbEnb can be configured; and for pre-configuration or when this filed is absent, the configuration is applicable for all synchronization reference types. |
| ***sl-ThresUE-Speed***  This filed indicates a UE absolute speed threshold. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *CBR* | The field is optionally present, Need R, when in *SL-CBR-CommonTxConfigList* in *SL-UE-SelectedConfig* in *SIB12* or *SidelinkPreconfigNR*; otherwise the field is not present, need R. |

– *SL-QoS-FlowIdentity*

The IE *SL-QoS-FlowIdentity* is used to identify a sidelink QoS flow.

***SL-QoS-FlowIdentity* information element**

-- ASN1START

-- TAG-SL-QOS-FLOWIDENTITY-START

SL-QoS-FlowIdentity-r16 ::= INTEGER (1..maxNrofSL-QFIs-r16)

-- TAG-SL-QOS-FLOWIDENTITY-STOP

-- ASN1STOP

– *SL-QoS-Profile*

The IE *SL-QoS-Profile* is used to give the QoS parameters for a sidelink QoS flow. Need codes or conditions specified for *SL-QoS-Profile* do not apply, in case *SL-QoS-Profile* is included in *SidelinkUEInformationNR*.

***SL-QoS-Profile* information element**

-- ASN1START

-- TAG-SL-QOS-PROFILE-START

SL-QoS-Profile-r16 ::= SEQUENCE {

sl-PQI-r16 SL-PQI-r16 OPTIONAL, -- Need R

sl-GFBR-r16 INTEGER (0..4000000000) OPTIONAL, -- Need R

sl-MFBR-r16 INTEGER (0..4000000000) OPTIONAL, -- Need R

sl-Range-r16 INTEGER (1..1000) OPTIONAL, -- Need R

...

}

SL-PQI-r16 ::= CHOICE {

sl-StandardizedPQI-r16 INTEGER (0..255),

sl-Non-StandardizedPQI-r16 SEQUENCE {

sl-ResourceType-r16 ENUMERATED {gbr, non-GBR, delayCriticalGBR, spare1} OPTIONAL, -- Need R

sl-PriorityLevel-r16 INTEGER (1..8) OPTIONAL, -- Need R

sl-PacketDelayBudget-r16 INTEGER (0..1023) OPTIONAL, -- Need R

sl-PacketErrorRate-r16 INTEGER (0..9) OPTIONAL, -- Need R

sl-AveragingWindow-r16 INTEGER (0..4095) OPTIONAL, -- Need R

sl-MaxDataBurstVolume-r16 INTEGER (0..4095) OPTIONAL, -- Need R

...

}

}

-- TAG-SL-QOS-PROFILE-STOP

-- ASN1STOP

| ***SL-QoS-Profile* field descriptions** |
| --- |
| ***sl-GFBR***  Indicate the guaranteed bit rate for a GBR QoS flow. The unit is: Kbit/s |
| ***sl-MFBR***  Indicate the maximum bit rate for a GBR QoS flow. The unit is: Kbit/s |
| ***sl-PQI***  This filed indicates either the PQI for standardized PQI or non-standardized QoS parameters. |
| ***sl-Range***  This field indicates the range parameter of the Qos flow, as defined in clause 5.4.1.1.1, TS 23.287 [55]. It is present only for groupcast. The unit is meter. |

| ***SL-PQI* field descriptions** |
| --- |
| ***sl-AveragingWindow***  Indicates the Averaging Window for a QoS flow, and applies to GBR QoS flows only. Unit: ms. The default value of the IE is 2000ms. |
| ***sl-MaxDataBurstVolume***  Indicates the Maximum Data Burst Volume for a QoS flow, and applies to delay critical GBR QoS flows only. Unit: byte. |
| ***sl-PacketDelayBudget***  Indicates the Packet Delay Budget for a QoS flow. Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms. |
| ***sl-PacketErrorRate***  Indicates the Packet Error Rate for a QoS flow. The packet error rate is expressed as Scalar x 10-k where k is the Exponent. |
| ***sl-PriorityLevel***  Indicates the Priority Level for a QoS flow. Values ordered in decreasing order of priority, i.e. with 1 as the highest priority and 8 as the lowest priority. |
| ***sl-StandardizedPQI***  Indicate the PQI for standardized PQI. |

– *SL-QuantityConfig*

The IE *SL*-*QuantityConfig* specifies the layer 3 filtering coefficients for NR SL RSRP measurement for a destination.

***SL-QuantityConfig* information element**

-- ASN1START

-- TAG-SL-QUANTITYCONFIG-START

SL-QuantityConfig-r16 ::= SEQUENCE {

sl-FilterCoefficientDMRS-r16 FilterCoefficient DEFAULT fc4,

...

}

-- TAG-SL-QuantityConfig-STOP

-- ASN1STOP

| ***SL-QuantityConfig* field descriptions** |
| --- |
| ***sl-FilterCoefficientDMRS***  DMRS based L3 filter configuration:  Specifies L3 fitler configuration for sidelink RSRP measurment result from the L1 fiter(s), as defined in TS 38.215 [9]. |

– *SL-RadioBearerConfig*

The IE *SL-RadioBearerConfig* specifies the sidelink DRB configuration information for NR sidelink communication.

***SL-RadioBearerConfig* information element**

-- ASN1START

-- TAG-SL-RADIOBEARERCONFIG-START

SL-RadioBearerConfig-r16 ::= SEQUENCE {

slrb-Uu-ConfigIndex-r16 SLRB-Uu-ConfigIndex-r16,

sl-SDAP-Config-r16 SL-SDAP-Config-r16 OPTIONAL, -- Cond SLRBSetup

sl-PDCP-Config-r16 SL-PDCP-Config-r16 OPTIONAL, -- Cond SLRBSetup

sl-TransRange-r16 ENUMERATED {m20, m50, m80, m100, m120, m150, m180, m200, m220, m250, m270, m300, m350, m370,

m400, m420, m450, m480, m500, m550, m600, m700, m1000, spare9, spare8, spare7, spare6,

spare5, spare4, spare3, spare2, spare1} OPTIONAL, -- Need R

...

}

-- TAG-SL-RADIOBEARERCONFIG-STOP

-- ASN1STOP

| ***SL-RadioBearerCoonfig* field descriptions** |
| --- |
| ***sl-PDCP-Config***  This field indicates the PDCP parameters for the sidelink DRB. |
| ***sl-SDAP-Config***  This field indicates how to map sidelink QoS flows to sidelink DRB. |
| ***slrb-Uu-ConfigIndex***  This field indicates the index of sidelink DRB configuration. |
| ***sl-TransRange***  This field indicates the transmission range of the sidelink DRB. The unit is meter. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SLRBSetup* | The field is mandatory present in case of sidelink DRB setup via the dedicated signalling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, need M. |

– *SL-ReportConfigList*

The IE *SL*-*ReportConfigList* concerns a list of SL measurement reporting configurations to add or modify for a destination.

***SL-ReportConfigList* information element**

-- ASN1START

-- TAG-SL-REPORTCONFIGLIST-START

SL-ReportConfigList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ReportConfigId-r16)) OF SL-ReportConfigInfo-r16

SL-ReportConfigInfo-r16 ::= SEQUENCE {

sl-ReportConfigId-r16 SL-ReportConfigId-r16,

sl-ReportConfig-r16 SL-ReportConfig-r16,

...

}

SL-ReportConfigId-r16 ::= INTEGER (1..maxNrofSL-ReportConfigId-r16)

SL-ReportConfig-r16 ::= SEQUENCE {

sl-ReportType-r16 CHOICE {

sl-Periodical-r16 SL-PeriodicalReportConfig-r16,

sl-EventTriggered-r16 SL-EventTriggerConfig-r16,

...

},

...

}

SL-PeriodicalReportConfig-r16 ::= SEQUENCE {

sl-ReportInterval-r16 ReportInterval,

sl-ReportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

sl-ReportQuantity-r16 SL-MeasReportQuantity-r16,

sl-RS-Type-r16 SL-RS-Type-r16,

...

}

SL-EventTriggerConfig-r16 ::= SEQUENCE {

sl-EventId-r16 CHOICE {

eventS1-r16 SEQUENCE {

s1-Threshold-r16 SL-MeasTriggerQuantity-r16,

sl-ReportOnLeave-r16 BOOLEAN,

sl-Hysteresis-r16 Hysteresis,

sl-TimeToTrigger-r16 TimeToTrigger,

...

},

eventS2-r16 SEQUENCE {

s2-Threshold-r16 SL-MeasTriggerQuantity-r16,

sl-ReportOnLeave-r16 BOOLEAN,

sl-Hysteresis-r16 Hysteresis,

sl-TimeToTrigger-r16 TimeToTrigger,

...

},

...

},

sl-ReportInterval-r16 ReportInterval,

sl-ReportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

sl-ReportQuantity-r16 SL-MeasReportQuantity-r16,

sl-RS-Type-r16 SL-RS-Type-r16,

...

}

SL-MeasReportQuantity-r16 ::= CHOICE {

sl-RSRP-r16 BOOLEAN,

...

}

SL-MeasTriggerQuantity-r16 ::= CHOICE {

sl-RSRP-r16 RSRP-Range,

...

}

SL-RS-Type-r16 ::= ENUMERATED {dmrs, spare3, spare2, spare1}

-- TAG-SL-REPORTCONFIGLIST-STOP

-- ASN1STOP

| ***SL-ReportConfig* field descriptions** |
| --- |
| ***sl-ReportType***  Type of the configured sidelink measurement report. |

| ***SL-EventTriggerConfig* field descriptions** |
| --- |
| ***sl-EventId***  Choice of sidelink measurement event triggered reporting criteria. |
| ***sl-ReportAmount***  Number of sidelink measurement reports applicable for *sl-EventTriggered* report type. |
| ***sl-ReportInterval***  Indicates the interval between periodical reports (i.e., when sl-ReportAmount exceeds 1) for *sl-EventTriggered* report type. |
| ***sl-ReportOnLeave***  indicates whether or not the UE shall initiate the sidelink measurement reporting procedure when the leaving condition is meet for a frequency in *sl-FrequencyTriggeredList*, as specified in 5.8.10.4.1. |
| ***sl-ReportQuantity***  The sidelink measurement quantities to be included in the sidelink measurement report. |
| ***sl-TimeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a sidelink measurement report. |
| ***sN-Threshold***  Threshold used for events S1 and S2 specified in subclauses 5.8.10.4.2 and 5.8.10.4.3, respectively. | |

| ***SL-PeriodicReportConfig* field descriptions** |
| --- |
| ***sl-ReportAmount***  Number of sidelink measurement reports applicable for *sl-Periodical* report type. |
| ***sl-ReportInterval***  Indicates the interval between periodical reports (i.e., when sl-ReportAmount exceeds 1) for *sl-Periodical* report type. |
| ***sl-ReportQuantity***  The sidelink measurement quantities to be included in the sidelink measurement report. |

– *SL-ResourcePool*

The IE *SL-ResourcePool* specifies the configuration information for NR sidelink communication resource pool.

***SL-ResourcePool* information element**

-- ASN1START

-- TAG-SL-RESOURCEPOOL-START

SL-ResourcePool-r16 ::= SEQUENCE {

sl-PSCCH-Config-r16 SetupRelease { SL-PSCCH-Config-r16 } OPTIONAL, -- Need M

sl-PSSCH-Config-r16 SetupRelease { SL-PSSCH-Config-r16 } OPTIONAL, -- Need M

sl-PSFCH-Config-r16 SetupRelease { SL-PSFCH-Config-r16 } OPTIONAL, -- Need M

sl-SyncAllowed-r16 SL-SyncAllowed-r16 OPTIONAL, -- Need M

sl-SubchannelSize-r16 ENUMERATED {n10, n12, n15, n20, n25, n50, n75, n100} OPTIONAL, -- Need M

sl-TimeResource-r16 INTEGER (10..160) OPTIONAL, -- Need M

sl-StartRB-Subchannel-r16 INTEGER (0..265) OPTIONAL, -- Need M

sl-NumSubchannel-r16 INTEGER (1..27) OPTIONAL, -- Need M

sl-Additional-MCS-Table-r16 ENUMERATED {qam256, qam64LowSE, qam256-qam64LowSE } OPTIONAL, -- Need M

sl-ThreshS-RSSI-CBR-r16 INTEGER (0..45) OPTIONAL, -- Need M

sl-TimeWindowSizeCBR-r16 ENUMERATED {ms100, slot100} OPTIONAL, -- Need M

sl-TimeWindowSizeCR-r16 ENUMERATED {ms1000, slot1000} OPTIONAL, -- Need M

sl-PTRS-Config-r16 SL-PTRS-Config-r16 OPTIONAL, -- Need M

sl-UE-SelectedConfigRP-r16 SL-UE-SelectedConfigRP-r16 OPTIONAL, -- Need M

sl-RxParametersNcell-r16 SEQUENCE {

sl-TDD-Configuration-r16 TDD-UL-DL-ConfigCommon OPTIONAL, -- Need M

sl-SyncConfigIndex-r16 INTEGER (0..15)

} OPTIONAL, -- Need M

sl-ZoneConfigMCR-List-r16 SEQUENCE (SIZE (16)) OF SL-ZoneConfigMCR-r16 OPTIONAL, -- Need M

sl-FilterCoefficient-r16 FilterCoefficient OPTIONAL, -- Need M

sl-RB-Number-r16 INTEGER (10..275) OPTIONAL, -- Need M

sl-PreemptionEnable-r16 ENUMERATED {enabled, pl1, pl2, pl3, pl4, pl5, pl6, pl7, pl8} OPTIONAL, -- Need R

sl-PriorityThreshold-UL-URLLC-r16 INTEGER (1..9) OPTIONAL, -- Need M

sl-PriorityThreshold-r16 INTEGER (1..9) OPTIONAL, -- Need M

sl-X-Overhead-r16 ENUMERATED {n0,n3, n6, n9} OPTIONAL, -- Need S

sl-PowerControl-r16 SL-PowerControl-r16 OPTIONAL, -- Need M

sl-TxPercentageList-r16 SL-TxPercentageList-r16 OPTIONAL, -- Need M

sl-MinMaxMCS-List-r16 SL-MinMaxMCS-List-r16 OPTIONAL, -- Need M

...

}

SL-ZoneConfigMCR-r16 ::= SEQUENCE {

sl-ZoneConfigMCR-Index-r16 INTEGER (0..15),

sl-TransRange-r16 ENUMERATED {m20, m50, m80, m100, m120, m150, m180, m200, m220, m250, m270, m300, m350,

m370, m400, m420, m450, m480, m500, m550, m600, m700, m1000, spare9, spare8,

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

OPTIONAL, -- Need M

sl-ZoneConfig-r16 SL-ZoneConfig-r16 OPTIONAL, -- Need M

...

}

SL-SyncAllowed-r16 ::= SEQUENCE {

gnss-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

gnbEnb-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

ue-Sync-r16 ENUMERATED {true} OPTIONAL -- Need R

}

SL-PSCCH-Config-r16 ::= SEQUENCE {

sl-TimeResourcePSCCH-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

sl-FreqResourcePSCCH-r16 ENUMERATED {n10,n12, n15, n20, n25} OPTIONAL, -- Need M

sl-DMRS-ScrambleID-r16 INTEGER (0..65535) OPTIONAL, -- Need M

sl-NumReservedBits-r16 INTEGER (2..4) OPTIONAL, -- Need M

...

}

SL-PSSCH-Config-r16 ::= SEQUENCE {

sl-PSSCH-DMRS-TimePatternList-r16 SEQUENCE (SIZE (1..3)) OF INTEGER (2..4) OPTIONAL, -- Need M

sl-BetaOffsets2ndSCI-r16 SEQUENCE (SIZE (4)) OF SL-BetaOffsets-r16 OPTIONAL, -- Need M

sl-Scaling-r16 ENUMERATED {f0p5, f0p65, f0p8, f1} OPTIONAL, -- Need M

...

}

SL-PSFCH-Config-r16 ::= SEQUENCE {

sl-PSFCH-Period-r16 ENUMERATED {sl0, sl1, sl2, sl4} OPTIONAL, -- Need M

sl-PSFCH-RB-Set-r16 BIT STRING (SIZE (10..275)) OPTIONAL, -- Need M

sl-NumMuxCS-Pair-r16 ENUMERATED {n1, n2, n3, n6} OPTIONAL, -- Need M

sl-MinTimeGapPSFCH-r16 ENUMERATED {sl2, sl3} OPTIONAL, -- Need M

sl-PSFCH-HopID-r16 INTEGER (0..1023) OPTIONAL, -- Need M

sl-PSFCH-CandidateResourceType-r16 ENUMERATED {startSubCH, allocSubCH} OPTIONAL, -- Need M

...

}

SL-PTRS-Config-r16 ::= SEQUENCE {

sl-PTRS-FreqDensity-r16 SEQUENCE (SIZE (2)) OF INTEGER (1..276) OPTIONAL, -- Need M

sl-PTRS-TimeDensity-r16 SEQUENCE (SIZE (3)) OF INTEGER (0..29) OPTIONAL, -- Need M

sl-PTRS-RE-Offset-r16 ENUMERATED {offset01, offset10, offset11} OPTIONAL, -- Need M

...

}

SL-UE-SelectedConfigRP-r16 ::= SEQUENCE {

sl-CBR-PriorityTxConfigList-r16 SL-CBR-PriorityTxConfigList-r16 OPTIONAL, -- Need M

sl-ThresPSSCH-RSRP-List-r16 SL-ThresPSSCH-RSRP-List-r16 OPTIONAL, -- Need M

sl-MultiReserveResource-r16 ENUMERATED {enabled} OPTIONAL, -- Need M

sl-MaxNumPerReserve-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

sl-SensingWindow-r16 ENUMERATED {ms100, ms1100} OPTIONAL, -- Need M

sl-SelectionWindowList-r16 SL-SelectionWindowList-r16 OPTIONAL, -- Need M

sl-ResourceReservePeriodList-r16 SEQUENCE (SIZE (1..16)) OF SL-ResourceReservePeriod-r16 OPTIONAL, -- Need M

sl-RS-ForSensing-r16 ENUMERATED {pscch, pssch},

...

}

SL-ResourceReservePeriod-r16 ::= CHOICE {

sl-ResourceReservePeriod1-r16 ENUMERATED {ms0, ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000},

sl-ResourceReservePeriod2-r16 INTEGER (1..99)

}

SL-SelectionWindowList-r16 ::= SEQUENCE (SIZE (8)) OF SL-SelectionWindowConfig-r16

SL-SelectionWindowConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-SelectionWindow-r16 ENUMERATED {n1, n5, n10, n20}

}

SL-TxPercentageList-r16 ::= SEQUENCE (SIZE (8)) OF SL-TxPercentageConfig-r16

SL-TxPercentageConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-TxPercentage-r16 ENUMERATED {p20, p35, p50}

}

SL-MinMaxMCS-List-r16 ::= SEQUENCE (SIZE (1..3)) OF SL-MinMaxMCS-Config-r16

SL-MinMaxMCS-Config-r16 ::= SEQUENCE {

sl-MCS-Table-r16 ENUMERATED {qam64, qam256, qam64LowSE},

sl-MinMCS-PSSCH-r16 INTEGER (0..27),

sl-MaxMCS-PSSCH-r16 INTEGER (0..31)

}

SL-BetaOffsets-r16 ::= INTEGER (0..31)

SL-PowerControl-r16 ::= SEQUENCE {

sl-MaxTransPower-r16 INTEGER (-30..33),

sl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

dl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

sl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need S

dl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

dl-Alpha-PSFCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

dl-P0-PSFCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

...

}

-- TAG-SL-RESOURCEPOOL-STOP

-- ASN1STOP

| ***SL-ZoneConfigMCR* field descriptions** |
| --- |
| ***sl-TransRange***  Indicates the communication range requirement for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfig***  Indicates the zone configuration for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfigMCR-Index***  Indicates the codepoint of the communication range requirement field in SCI. |

|  |
| --- |
| ***SL-ResourcePool* field descriptions** |
| ***sl-FilterCoefficient***  This field indicates the filtering coefficient for long-term measurement and reference signal power derivation used for sideilnk open-loop power control. |
| ***sl-Additional-MCS-Table***  Indicates the MCS table(s) additionally used in the resource pool. 64QAM table is (pre-)configured as default. Zero, one or two can be additionally (pre-)configured using the 256QAM and/or low-SE MCS tables |
| ***sl-NumSubchannel***  Indicates the number of subchannels in the corresponding resource pool, which consists of contiguous PRBs only. |
| ***sl-PreemptionEnable***  Indiates whether pre-emption is disabled or enabled in a resource pool. If enabled, a priority level p\_preemption can be optionally configured. If the pre-emption is enabled but p\_preemption is not configured, pre-emption is applicable to all levels. |
| ***sl-PriorityThreshold-UL-URLLC***  Indicates the threshold used to determine whether NR sidelink transmission or PUCCH transmission carrying SL HARQ is prioritized over uplink transmission of priority index 1 if they overlap in time. |
| ***sl-PriorityThreshold***  Indicates the threshold used to determine whether NR sidelink transmission or PUCCH transmission carrying SL HARQ is prioritized over uplink transmission of priority index 0 if they overlap in time. |
| ***sl-RB-Number***  Indicates the number of PRBs in the corresponding resource pool, which consists of contiguous PRBs only. The remaining RB cannot be used (See TS 38.214[19], clause 8). |
| ***sl-StartRB-Subchannel***  Indicates the lowest RB index of the subchannel with the lowest index in the resource pool with respect to the lowest RB index of a SL BWP. |
| ***sl-SubchannelSize***  Indicates the minimum granularity in frequency domain for the sensing for PSSCH resource selection in the unit of PRB. |
| ***sl-SyncAllowed***  Indicates the allowed synchronization reference(s) which is (are) allowed to use the configured resource pool. |
| ***sl-SyncConfigIndex***  Indicates the synchronisation configuration that is associated with a reception pool, by means of an index to the corresponding entry *SL-SyncConfigList* of in *SIB12* for NR sidelink communication. |
| ***sl-TDD-Configuration***  Indicates the TDD configuration associated with the reception pool of the cell indicated by *sl-SyncConfigIndex*. |
| ***sl-ThreshS-RSSI-CBR***  Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n\*2) dBm, and so on. |
| ***sl-TimeResource***  Indicates the bitmap of the resource pool, which is defined by repeating the bitmap with a periodicity during a SFN or DFN cycle. |
| ***sl-TimeWindowSizeCBR***  Indicates the time window size for CBR measurement. |
| ***sl-TimeWindowSizeCR***  Indicates the time window size for CR evaluation. |
| ***sl-TxPercentageList***  Indicates the portion of candidate single-slot PSSCH resources over the toal resources. Value p20 corresponds to 20%, and so on. |
| ***sl-X-Overhead***  Accounts for overhead from CSI-RS, PT-RS. If the field is absent, the UE applies value *n0* (see TS 38.214 [19], clause 5.1.3.2). |

| ***SL-SyncAllowed* field descriptions** |
| --- |
| ***gnbEnb-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to eNB or gNB (i.e., synchronized to a reference UE which is directly synchronized to eNB or gNB). |
| ***gnss-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to GNSS (i.e., synchronized to a reference UE which is directly synchronized to GNSS). |
| ***ue-Sync***  If configured, the (pre-) configured resources can be used if the UE is synchronized to a reference UE which is not synchronized to eNB, gNB and GNSS directly or indirectly. |

| ***SL-PSCCH* field descriptions** |
| --- |
| ***sl-FreqResourcePSCCH***  Indicates the number of PRBs for PSCCH in a resource pool where it is not greater than the number PRBs of the subchannel. |
| ***sl-DMRS-ScrambleID***  Indicates the initialization value for PSCCH DMRS scrambling. |
| ***sl-NumReservedBits***  Indicates the number of reserved bits in first stage SCI. |
| ***sl-TimeResourcePSCCH***  Indicates the number of symbols of PSCCH in a resource pool. |

| ***SL-PSSCH* field descriptions** |
| --- |
| ***sl-BetaOffsets2ndSCI***  Indicates candidates of beta-offset values to determine the number of coded modulation symbols for second stage SCI. The value indicates the index of Table 9.3-2 of TS 38.213 |
| ***sl-PSSCH-DMRS-TimePatternList***  Indicates the set of PSSCH DMRS time domain patterns in terms of PSSCH DMRS symbols in a slot that can be used in the resource pool. |
| ***sl-Scaling***  Indicates a scaling factor to limit the number of resource elements assigned to the second stage SCI on PSSCH. Value *f0p5* corresponds to 0.5, value *f0p65* corresponds to 0.65, and so on. |

| ***SL-PSFCH* field descriptions** |
| --- |
| ***sl-PSFCH-CandidateResourceType***  Indicates the number of PSFCH resources available for multiplexing HARQ-ACK information in a PSFCH transmission (see TS 38.213 clause 16.3) |
| ***sl-PSFCH-Period***  Indicates the period of PSFCH resource in the unit of slots within this resource pool. If set to *sl0*, no resource for PSFCH, and HARQ feedback for all transmissions in the resource pool is disabled. |
| ***sl-PSFCH-RB-Set***  Indicates the set of PRBs that are actually used for PSFCH transmission and reception. The leftmost bit of the bitmap refers to the lowest RB index in the resource pool, and so on |

| ***SL-UE-SelectedConfigRP* field descriptions** |
| --- |
| ***sl-MaxNumPerReserve***  Indicates the maximum number of reserved PSCCH/PSSCH resources that can be indicated by an SCI. |
| ***sl-MultiReserveResource***  Indicates if it is allowed to reserve a sidelink resource for an initial transmission of a TB by an SCI associated with a different TB, based on sensing and resource selection procedure. |
| ***sl-ResourceReservePeriodList***  Set of possible resource reservation period allowed in the resource pool in the unit of ms. Up to 16 values can be configured per resource pool. |
| ***sl-RS-ForSensing***  Indicates whether DMRS of PSCCH or PSSCH is used for L1 RSRP measurement in the sensing operation. |
| ***sl-SensingWindow***  Parameter that indicates the start of the sensing window. |
| ***sl-SelectionWindowList***  Parameter that determines the end of the selection window in the resource selection for a TB with respect to priority indicated in SCI. Value n1 corresponds to 1\*2µ, value n5 corresponds to 5\*2µ, and so on, where µ = 0,1,2,3 for SCS 15,30,60,120 kHz respectively. |
| ***sl-ThresPSSCH-RSRP-List***  Indicates a list of 64 thresholds, and the threshold should be selected based on the priority in the decoded SCI and the priority in the SCI to be transmitted. A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above a threshold. |

| ***SL-PowerControl* field descriptions** |
| --- |
| ***sl-MaxTransPower***  Indicates the maximum value of the UE's sidelink transmission power on this resource pool. The unit is dBm. |
| ***sl-Alpha-PSSCH-PSCCH***  Indicates alpha value for sidelink pathloss based power control for PSCCH/PSSCH when sl-P0-PSSCH is configured. When the field is absent the UE applies the value 1. |
| ***sl-P0-PSSCH-PSCCH***  Indicates P0 value for sidelink pathloss based power control for PSCCH/PSSCH. If not configured, sidelink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSSCH-PSCCH***  Indicates alpha value for downlink pathloss based power control for PSCCH/PSSCH when dl-P0-PSSCH is configured. When the field is absent the UE applies the value 1. |
| ***dl-P0-PSSCH-PSCCH***  Indicates P0 value for downlink pathloss based power control for PSCCH/PSSCH. If not configured, downlink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSFCH***  Indicates alpha value for downlink pathloss based power control for PSFCH when dl-P0-PSFCH is configured. When the field is absent the UE applies the value 1. |
| ***dl-P0-PSFCH***  Indicates P0 value for downlink pathloss based power control for PSFCH. If not configured, downlink pathloss based power control is disabled for PSFCH. |

| ***SL-MinMaxMCS-Config* field descriptions** |
| --- |
| ***sl-MaxMCS-PSSCH***  Indicates the maximum MCS value used for Mode 1 configured and dynamic grants when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |
| ***sl-MinMCS-PSSCH***  Indicates the minimum MCS value for Mode 1 configured and dynamic grants when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |

– *SL-RLC-BearerConfig*

The IE *SL-RLC-BearerConfig* specifies the SL RLC bearer configuration information for NR sidelink communication.

***SL-RLC-BearerConfig* information element**

-- ASN1START

-- TAG-SL-RLC-BEARERCONFIG-START

SL-RLC-BearerConfig-r16 ::= SEQUENCE {

sl-RLC-BearerConfigIndex-r16 SL-RLC-BearerConfigIndex-r16,

sl-ServedRadioBearer-r16 SLRB-Uu-ConfigIndex-r16 OPTIONAL, -- Cond LCH-SetupOnly

sl-RLC-Config-r16 SL-RLC-Config-r16 OPTIONAL, -- Cond LCH-Setup

sl-MAC-LogicalChannelConfig-r16 SL-LogicalChannelConfig-r16 OPTIONAL, -- Cond LCH-Setup

...

}

-- TAG-SL-RLC-BEARERCONFIG-STOP

-- ASN1STOP

| ***SL-RLC-BearerCoonfig* field descriptions** |
| --- |
| ***sl-MAC-LogicalChannelConfig***  The field is used to configure MAC SL logical channel paramenters. |
| ***sl-RLC-BearerConfigIndex***  The index of the RLC bearer configuration. |
| ***sl-RLC-Config***  Determines the RLC mode (UM, AM) and provides corresponding parameters. |
| ***sl-ServedRadioBearer***  Associates the sidelink RLC Bearer with a sidelink DRB. It indicates the index of SL radio bearer configuration, which is corresponding to the RLC bearer configuration. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *LCH-Setup* | The field is mandatory present upon creation of a new sidelink logical channel via the dedicated signalling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, Need M. |
| *LCH-SetupOnly* | This field is mandatory present upon creation of a new sidelink logical channel via the dedicated signalling and in case of sidelink DRB configuration via system information and pre-configuration. Otherwise, it is absent, Need M. |

– *SL-RLC-BearerConfigIndex*

The IE *SL-RadioBearerConfigIndex* is used to identify a SL RLC bearer configuration.

***SL-RadioBearerConfigIndex* information element**

-- ASN1START

-- TAG-SL-RLC-BEARERCONFIGINDEX-START

SL-RLC-BearerConfigIndex-r16 ::= INTEGER (1..maxSL-LCID-r16)

-- TAG-RLC-BEARERCONFIGINDEX-STOP

-- ASN1STOP

– *SL-RLC-Config*

The IE *SL-RLC-Config* is used to specify the RLC configuration of sidelink DRB. RLC AM configuration is only applicable to the unicast NR sidelink communication.

***SL-RLC-Config* information element**

-- ASN1START

-- TAG-SL-RLC-CONFIG-START

SL-RLC-Config-r16 ::= CHOICE {

sl-AM-RLC-r16 SEQUENCE {

sl-SN-FieldLengthAM-r16 SN-FieldLengthAM OPTIONAL, -- Cond SLRBSetup

sl-T-PollRetransmit-r16 T-PollRetransmit,

sl-PollPDU-r16 PollPDU,

sl-PollByte-r16 PollByte,

sl-MaxRetxThreshold-r16 ENUMERATED { t1, t2, t3, t4, t6, t8, t16, t32 },

...

},

sl-UM-RLC-r16 SEQUENCE {

sl-SN-FieldLengthUM-r16 SN-FieldLengthUM OPTIONAL, -- Cond SLRBSetup

...

},

...

}

-- TAG-SL-RLC-CONFIG-STOP

-- ASN1STOP

| ***SL-RLC-Config* field descriptions** |
| --- |
| ***sl-SN-FieldLengthUM***  For groupcast and broadcast, only 6 bits SN length is supported. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SLRBSetup* | The field is mandatory present in case of sidelink DRB setup via the dedicated signalling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, need M. |

– *SL-ScheduledConfig*

The IE *SL-ScheduledConfig* specifies sidelink communication configurations used for network scheduled NR sidelink communication.

***SL-ScheduledConfig* information element**

-- ASN1START

-- TAG-SL-SCHEDULEDCONFIG-START

SL-ScheduledConfig-r16 ::= SEQUENCE {

sl-RNTI-r16 RNTI-Value,

mac-MainConfigSL-r16 MAC-MainConfigSL-r16 OPTIONAL, -- Need M

sl-CS-RNTI-r16 RNTI-Value OPTIONAL, -- Need M

sl-PSFCH-ToPUCCH-r16 SEQUENCE (SIZE (1..8)) OF INTEGER (0..15) OPTIONAL, -- Need M

sl-ConfiguredGrantConfigList-r16 SL-ConfiguredGrantConfigList-r16 OPTIONAL, -- Need M

...

}

MAC-MainConfigSL-r16 ::= SEQUENCE {

sl-BSR-Config-r16 BSR-Config OPTIONAL, -- Need M

ul-PrioritizationThres-r16 INTEGER (1..16) OPTIONAL, -- Cond SLThreshold

sl-PrioritizationThres-r16 INTEGER (1..8) OPTIONAL, -- Cond ULThreshold

...

}

SL-ConfiguredGrantConfigList-r16 ::= SEQUENCE {

sl-ConfiguredGrantConfigToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofCG-SL-r16)) OF SL-ConfigIndexCG-r16 OPTIONAL, -- Need N

sl-ConfiguredGrantConfigToAddModList-r16 SEQUENCE (SIZE (1..maxNrofCG-SL-r16)) OF SL-ConfiguredGrantConfig-r16 OPTIONAL -- Need N

}

-- TAG-SL-SCHEDULEDCONFIG-STOP

-- ASN1STOP

| ***SL-ScheduledConfig* field descriptions** |
| --- |
| ***sl-CS-RNTI***  Indicate the RNTI used to scramble CRC of DCI format 3\_0, see TS 38.321 [3]. |
| ***sl-PSFCH-ToPUCCH***  For dynamic grant and configured grant type 2, configure the values of the PSFCH to PUCCH gap. The field PSFCH-to-HARQ\_feedback timing indicator in DCI format 3\_0 selects one of the configured values of the PSFCH to PUCCH gap. |
| ***sl-RNTI***  Indicate the C-RNTI used for monitoring the network scheduling to transmit NR sidelink communication (i.e. the mode 1). |

| ***MAC-MainConfigSL* field descriptions** |
| --- |
| ***sl-BSR-Config***  This field is to configure the sidelink buffer status report. |
| ***sl-PrioritizationThres***  Indicates the SL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. |
| ***ul-PrioritizationThres***  Indicates the UL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SLThreshold* | The field is mandatory present if the field *sl- PrioritizationThres* is configured; otherwise it is absent, Need M. |
| *ULThreshold* | The field is mandatory present if the field *ul- PrioritizationThres* is configured; otherwise it is absent, Need M. |

– *SL-SDAP-Config*

The IE *SL-SDAP-Config* is used to set the configurable SDAP parameters for a Sidelink DRB.

***SL-SDAP-Config* information element**

-- ASN1START

-- TAG-SL-SDAP-CONFIG-START

SL-SDAP-Config-r16 ::= SEQUENCE {

sl-SDAP-Header-r16 ENUMERATED {present, absent},

sl-DefaultRB-r16 BOOLEAN,

sl-MappedQoS-Flows-r16 CHOICE {

sl-MappedQoS-FlowsList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIs-r16)) OF SL-QoS-Profile-r16,

sl-MappedQoS-FlowsListDedicated-r16 SL-MappedQoS-FlowsListDedicated-r16

} OPTIONAL, -- Need M

sl-CastType-r16 ENUMERATED {broadcast, groupcast, unicast, spare1} OPTIONAL, -- Need M

...

}

SL-MappedQoS-FlowsListDedicated-r16 ::= SEQUENCE {

sl-MappedQoS-FlowsToAddList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIs-r16)) OF SL-QoS-FlowIdentity-r16 OPTIONAL, -- Need N

sl-MappedQoS-FlowsToReleaseList-16 SEQUENCE (SIZE (1..maxNrofSL-QFIs-r16)) OF SL-QoS-FlowIdentity-r16 OPTIONAL -- Need N

}

-- TAG-SL-SDAP-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-SDAP-Config* field descriptions** |
| ***sl-DefaultRB***  Indicates whether or not this is the default sidelink DRB for this NR sidelink communication transmission destination. Among all configured instances of *SL-SDAP-Config* with the same value of *sl-DestinationIdentity*, this field shall be set to *true* in at most one instance of *SL-SDAP-Config* and to *false* in all other instances. |
| ***sl-MappedQoS-Flows***  Indicates QoS flows to be mapped to the sidelink DRB. If the field is included in dedicated signalling, it is set to *sl-MappedQoS-FlowsListDedicated*; otherwise, it is set fo *sl-MappedQoS-FlowsList*. |
| ***sl-MappedQoS-FlowsList***  Indicates the list of SL QoS flows ID of the NR sidelink communication transmission destination mapped to this sidelink DRB. |
| ***sl-MappedQoS-FlowsToAddList***  Indicates the list of SL QoS flows ID of the NR sidelink communication transmission destination to be additionally mapped to this sidelink DRB. |
| ***sl-MappedQoS-FlowsToReleaseList***  Indicates the list of SL QoS flows ID of the NR sidelink communication transmission destination to be released from existing QoS flow to SLRB mapping of this sidelink DRB. |
| ***sl-SDAP-Header***  Indicates whether or not a SDAP header is present on this sidelink DRB. The field cannot be changed after a sidelink DRB is established. This field is set to present if the field *sl-DefaultRB* is set to *true*. |

– *SL-SyncConfig*

The IE *SL-SyncConfig* specifies the configuration information concerning reception of synchronisation signals from neighbouring cells as well as concerning the transmission of synchronisation signals for sidelink communication.

***SL-SyncConfig* information element**

-- ASN1START

-- TAG-SL-SYNCCONFIG-START

SL-SyncConfigList-r16 ::= SEQUENCE (SIZE (1..maxSL-SyncConfig-r16)) OF SL-SyncConfig-r16

SL-SyncConfig-r16 ::= SEQUENCE {

sl-SyncRefMinHyst-r16 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL, -- Need R

sl-SyncRefDiffHyst-r16 ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf} OPTIONAL, -- Need R

sl-filterCoefficient-r16 FilterCoefficient OPTIONAL, -- Need R

sl-SSB-TimeAllocation1-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

sl-SSB-TimeAllocation2-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

sl-SSB-TimeAllocation3-r16 SL-SSB-TimeAllocation-r16 OPTIONAL, -- Need R

sl-SSID-r16 INTEGER (0..671) OPTIONAL, -- Need R

txParameters-r16 SEQUENCE {

syncTxThreshIC-r16 SL-RSRP-Range-r16 OPTIONAL, -- Need R

syncTxThreshOoC-r16 SL-RSRP-Range-r16 OPTIONAL, -- Need R

syncInfoReserved-r16 BIT STRING (SIZE (2)) OPTIONAL -- Need R

},

gnss-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

...

}

SL-RSRP-Range-r16 ::= INTEGER (0..13)

SL-SSB-TimeAllocation-r16 ::= SEQUENCE {

sl-NumSSB-WithinPeriod-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL, -- Need R

sl-TimeOffsetSSB-r16 INTEGER (0..1279) OPTIONAL, -- Need R

sl-TimeInterval-r16 INTEGER (0..639) OPTIONAL -- Need R

}

-- TAG-SL-SYNCCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-SyncConfig* field descriptions** |
| ***gnss-Sync***  if configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to GNSS. If not configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to eNB/gNB. |
| ***sl-SyncRefMinHyst***  Hysteresis when evaluating a SyncRef UE using absolute comparison. |
| ***sl-SyncRefDiffHyst***  Hysteresis when evaluating a SyncRef UE using relative comparison. |
| ***sl-NumSSB-WithinPeriod***  Indicates the number of sidelink SSB transmissions within one sidelink SSB period. The applicable values are related to the subcarrier spacing and frequency as follows:  FR1, SCS = 15 kHz: 1, 2  FR1, SCS = 30 kHz: 1, 2, 4  FR1, SCS = 60 kHz: 1, 2, 4, 8  FR2, SCS = 60 kHz: 1, 2, 4, 8, 16, 32  FR2, SCS = 120 kHz: 1, 2, 4, 8, 16, 32, 64 |
| ***sl-TimeOffsetSSB***  Indicates the slot offset from the start of sidelink SSB period to the first sidelink SSB. |
| ***sl-TimeInterval***  Indicates the slot interval between neighboring sidelink SSBs. This value is applicable when there are more than one sidelink SSBs within one sidelink SSB period. |
| ***sl-SSID***  Indicates the ID of sidelink synchronization signal assoicated with different synchronization priorities. |
| ***SL-RSRP-Range***  Value 0 corresponds to -infinity, value 1 to -115dBm, value 2 to -110dBm, and so on (i.e. in steps of 5dBm) until value 12, which corresponds to -60dBm, while value 13 corresponds to +infinity. |
| ***syncInfoReserved***  Reserved for future use. |

– *SL-ThresPSSCH-RSRP-List*

IE *SL-ThresPSSCH-RSRP-List* indicates a threshold used for sensing based UE autonomous resource selection (see TS 38.215 [9]). A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above the threshold defined by IE *SL-ThresPSSCH-RSRP-List*.

***SL-ThresPSSCH-RSRP-List* information element**

-- ASN1START

-- TAG-SL-THRESPSSCH-RSRP-LIST-START

SL-ThresPSSCH-RSRP-List-r16 ::= SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r16

SL-ThresPSSCH-RSRP-r16 ::= INTEGER (0..66)

-- TAG-SL-THRESPSSCH-RSRP-LIST-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-ThresPSSCH-RSRP-List* field descriptions** |
| ***SL-ThresPSSCH-RSRP***  Value 0 corresponds to minus infinity dBm, value 1 corresponds to -128dBm, value 2 corresponds to -126dBm, value n corresponds to (-128 + (n-1)\*2) dBm and so on, value 66 corresponds to infinity dBm. |

– *SL-TxPower*

The IE *SL-TxPower* is used to limit the UE's sidelink transmission power on a carrier frequency. The unit is dBm. Value minusinfinity corresponds to –infinity.

***SL-TxPower* information element**

-- ASN1START

-- TAG-SL-TXPOWER-START

SL-TxPower-r16 ::= CHOICE{

minusinfinity-r16 NULL,

txPower-r16 INTEGER (-30..33)

}

-- TAG-SL-TXPOWER-STOP

-- ASN1STOP

– *SL-TypeTxSync*

The IE *SL-TypeTxSync* indicates the synchronization reference type.

***SL-TypeTxSync* information element**

-- ASN1START

-- TAG-SL-TYPETXSYNC-START

SL-TypeTxSync-r16 ::= ENUMERATED {gnss, gnbEnb, ue}

-- TAG-SL-TYPETXSYNC-STOP

-- ASN1STOP

– *SL-UE-SelectedConfig*

IE *SL-UE-SelectedConfig* specifies sidelink communication configurations used for UE autonomous resource selection.

***SL-UE-SelectedConfig* information element**

-- ASN1START

-- TAG-SL-UE-SELECTEDCONFIG-START

SL-UE-SelectedConfig-r16 ::= SEQUENCE {

sl-PSSCH-TxConfigList-r16 SL-PSSCH-TxConfigList-r16 OPTIONAL, -- Need R

sl-ProbResourceKeep-r16 ENUMERATED {v0, v0dot2, v0dot4, v0dot6, v0dot8} OPTIONAL, -- Need R

sl-ReselectAfter-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n7, n8, n9} OPTIONAL, -- Need R

sl-CBR-CommonTxConfigList-r16 SL-CBR-CommonTxConfigList-r16 OPTIONAL, -- Need R

ul-PrioritizationThres-r16 INTEGER (1..16) OPTIONAL, -- Need R

sl-PrioritizationThres-r16 INTEGER (1..8) OPTIONAL, -- Need R

...

}

-- TAG-SL-UE-SELECTEDCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-UE-SelectedConfig* field descriptions** |
| ***sl-PrioritizationThres***  Indicates the SL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. |
| ***sl-ProbResourceKeep***  Indicates the probability with which the UE keeps the current resource when the resource reselection counter reaches zero for sensing based UE autonomous resource selection (see TS 38.321 [3]). |
| ***sl-PSSCH-TxConfigList***  Indicates PSSCH TX parameters such as MCS, sub-channel number, retransmission number, associated to different UE absolute speeds and different synchronization reference types for UE autonomous resource selection. |
| ***sl-ReselectAfter***  Indicates the number of consecutive skipped transmissions before triggering resource reselection for sidelink communication (see TS 38.321 [3]). |
| ***ul-PrioritizationThres***  Indicates the UL priority threshold, which is used to determine whether SL TX is prioritized over UL TX, as specified in TS 38.321 [3]. |

– *SL-ZoneConfig*

The IE *SL-ZoneConfig* is used to configure the zone ID related parameters.

***SL-ZoneConfig* information element**

-- ASN1START

-- TAG-SL-ZONECONFIG-START

SL-ZoneConfig-r16 ::= SEQUENCE {

sl-ZoneLength-r16 ENUMERATED { m5, m10, m20, m30, m40, m50, spare2, spare1},

...

}

-- TAG-SL-ZONECONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-ZoneConfig* field descriptions** |
| ***sl-ZoneLength***  Indicates the length of each geographic zone. |

– *SLRB-Uu-ConfigIndex*

The IE *SLRB-Uu-ConfigIndex* is used to identify a sidelink DRB configuration from the network side.

***SLRB-Uu-ConfigIndex* information element**

-- ASN1START

-- TAG-SLRB-UU-CONFIGINDEX-START

SLRB-Uu-ConfigIndex-r16 ::= INTEGER (1..maxNrofSLRB-r16)

-- TAG-SLRB-UU-CONFIGINDEX-STOP

-- ASN1STOP

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

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 for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= 95 -- Maximum number of CSI-RS resources 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 in an SRS resource set 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 NR-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

6.5 Short Message

Short Messages can be transmitted on PDCCH using P-RNTI with or without associated *Paging* message using Short Message field in DCI format 1\_0 (see TS 38.212 [17], clause 7.3.1.2.1).

Table 6.5-1 defines Short Messages. Bit 1 is the most significant bit.

**Table 6.5-1: Short Messages**

|  |  |
| --- | --- |
| **Bit** | **Short Message** |
| 1 | ***systemInfoModification***  If set to 1: indication of a BCCH modification other than SIB6, SIB7 and SIB8. |
| 2 | ***etwsAndCmasIndication***  If set to 1: indication of an ETWS primary notification and/or an ETWS secondary notification and/or a CMAS notification. |
| 3 | ***stopPagingMonitoring***  This bit can be used for only operation with shared spectrum channel access and if *nrofPDCCH-MonitoringOccasionPerSSB-InPO* is present.  If set to 1: indication that the UE may stop monitoring PDCCH occasion(s) for paging in this Paging Occasion as specified in TS 38.304 [20], clause 7.1. |
| 4 – 8 | Not used in this release of the specification, and shall be ignored by UE if received. |

6.6 PC5 RRC messages

6.6.1 General message structure

– *PC5-RRC-Definitions*

This ASN.1 segment is the start of the PC5 RRC PDU definitions.

-- ASN1START

-- TAG-PC5-RRC-DEFINITIONS-START

PC5-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

SetupRelease,

RRC-TransactionIdentifier,

SN-FieldLengthAM,

SN-FieldLengthUM,

LogicalChannelIdentity,

maxNrofSLRB-r16,

maxNrofSL-QFIs-r16,

maxNrofSL-QFIsPerDest-r16,

RSRP-Range,

SL-MeasConfig-r16,

SL-MeasId-r16,

FreqBandList,

FreqBandIndicatorNR,

maxSimultaneousBands,

maxBandComb,

maxBands,

BandParametersSidelink-r16

FROM NR-RRC-Definitions;

-- TAG-PC5-RRC-DEFINITIONS-STOP

-- ASN1STOP

– *SBCCH-SL-BCH-Message*

The *SBCCH-SL-BCH-Message* class is the set of RRC messages that may be sent from the UE to the UE via SL-BCH on the SBCCH logical channel.

-- ASN1START

-- TAG-SBCCH-SL-BCH-MESSAGE-START

SBCCH-SL-BCH-Message ::= SEQUENCE {

message SBCCH-SL-BCH-MessageType

}

SBCCH-SL-BCH-MessageType::= CHOICE {

c1 CHOICE {

masterInformationBlockSidelink MasterInformationBlockSidelink,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-SBCCH-SL-BCH-MESSAGE-STOP

-- ASN1STOP

– *SCCH-Message*

The *SCCH-Message* class is the set of RRC messages that may be sent from the UE to the UE for unicast of NR sidelink communication on SCCH logical channel.

-- ASN1START

-- TAG-SCCH-MESSAGE-START

SCCH-Message ::= SEQUENCE {

message SCCH-MessageType

}

SCCH-MessageType ::= CHOICE {

c1 CHOICE {

measurementReportSidelink MeasurementReportSidelink,

rrcReconfigurationSidelink RRCReconfigurationSidelink,

rrcReconfigurationCompleteSidelink RRCReconfigurationCompleteSidelink,

rrcReconfigurationFailureSidelink RRCReconfigurationFailureSidelink,

ueCapabilityEnquirySidelink UECapabilityEnquirySidelink,

ueCapabilityInformationSidelink UECapabilityInformationSidelink,

spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-SCCH-MESSAGE-STOP

-- ASN1STOP

6.6.2 Message definitions

– *MasterInformationBlockSidelink*

The *MasterInformationBlockSidelink* includes the system information transmitted by a UE via SL-BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: SBCCH

Direction: UE to UE

***MasterInformationBlockSidelink***

-- ASN1START

-- TAG-MASTERINFORMATIONBLOCKSIDELINK-START

MasterInformationBlockSidelink ::= SEQUENCE {

sl-TDD-Config-r16 BIT STRING (SIZE (12)),

inCoverage-r16 BOOLEAN,

directFrameNumber-r16 BIT STRING (SIZE (10)),

slotIndex-r16 BIT STRING (SIZE (7)),

reservedBits-r16 BIT STRING (SIZE (2))

}

-- TAG-MASTERINFORMATIONBLOCKSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| ***MasterInformationBlockSidelink* field descriptions** |
| ***directFrameNumber***  Indicates the frame number in which S-SSB transmitted. |
| ***inCoverage***  Value true indicates that the UE transmitting the *MasterInformationBlockSidelink* is in network coverage, or UE selects GNSS timing as the synchronization reference source. |
| ***slotIndex***  Indicates the slot index in which S-SSB transmitted. |

– *MeasurementReportSidelink*

The *MeasurementReportSidelink* message is used for the indication of measurement results of NR sidelink.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***MeasurementReportSidelink* message**

-- ASN1START

-- TAG-MEASUREMENTREPORTSIDELINK-START

MeasurementReportSidelink ::= SEQUENCE {

criticalExtensions CHOICE {

measurementReportSidelink-r16 MeasurementReportSidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

MeasurementReportSidelink-IEs-r16 ::= SEQUENCE {

sl-measResults-r16 SL-MeasResults-r16,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

SL-MeasResults-r16 ::= SEQUENCE {

sl-MeasId-r16 SL-MeasId-r16,

sl-MeasResult-r16 SL-MeasResult-r16,

...

}

SL-MeasResult-r16 ::= SEQUENCE {

sl-ResultDMRS-r16 SL-MeasQuantityResult-r16 OPTIONAL,

...

}

SL-MeasQuantityResult-r16 ::= SEQUENCE {

sl-RSRP-r16 RSRP-Range OPTIONAL,

...

}

-- TAG-MEASUREMENTREPORTSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| ***MeasurementReportSidelink* field descriptions** |
| ***sl-MeasId***  Identifies the sidelink measurement identity for which the reporting is being performed. |
| ***sl-MeasResult***  Measured RSRP results of a unicast destination. |

– *RRCReconfigurationSidelink*

The *RRCReconfigurationSidelink* message is the command to AS configuration of the PC5 RRC connection. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***RRCReconfigurationSidelink* message**

-- ASN1START

-- TAG-RRCRECONFIGURATIONSIDELINK-START

RRCReconfigurationSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationSidelink-r16 RRCReconfigurationSidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationSidelink-IEs-r16 ::= SEQUENCE {

slrb-ConfigToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-Config-r16 OPTIONAL, -- Need N

slrb-ConfigToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-PC5-ConfigIndex-r16 OPTIONAL, -- Need N

sl-MeasConfig-r16 SetupRelease {SL-MeasConfig-r16} OPTIONAL, -- Need M

sl-CSI-RS-Config-r16 SetupRelease {SL-CSI-RS-Config-r16} OPTIONAL, -- Need M

sl-ResetConfig-r16 ENUMERATED {true} OPTIONAL, -- Need N

sl-LatencyBoundCSI-Report-r16 INTEGER (3..160) OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SLRB-Config-r16::= SEQUENCE {

slrb-PC5-ConfigIndex-r16 SLRB-PC5-ConfigIndex-r16,

sl-SDAP-ConfigPC5-r16 SL-SDAP-ConfigPC5-r16 OPTIONAL, -- Need M

sl-PDCP-ConfigPC5-r16 SL-PDCP-ConfigPC5-r16 OPTIONAL, -- Need M

sl-RLC-ConfigPC5-r16 SL-RLC-ConfigPC5-r16 OPTIONAL, -- Need M

sl-MAC-LogicalChannelConfigPC5-r16 SL-LogicalChannelConfigPC5-r16 OPTIONAL, -- Need M

...

}

SLRB-PC5-ConfigIndex-r16 ::= INTEGER (1..maxNrofSLRB-r16)

SL-SDAP-ConfigPC5-r16 ::= SEQUENCE {

sl-MappedQoS-FlowsToAddList-r16 SEQUENCE (SIZE (1.. maxNrofSL-QFIsPerDest-r16)) OF SL-PQFI-r16 OPTIONAL, -- Need N

sl-MappedQoS-FlowsToReleaseList-r16 SEQUENCE (SIZE (1.. maxNrofSL-QFIsPerDest-r16)) OF SL-PQFI-r16 OPTIONAL, -- Need N

sl-SDAP-Header-r16 ENUMERATED {present, absent},

...

}

SL-PDCP-ConfigPC5-r16 ::= SEQUENCE {

sl-PDCP-SN-Size-r16 ENUMERATED {len12bits, len18bits} OPTIONAL, -- Need M

sl-OutOfOrderDelivery-r16 ENUMERATED { true } OPTIONAL, -- Need R

...

}

SL-RLC-ConfigPC5-r16 ::= CHOICE {

sl-AM-RLC-r16 SEQUENCE {

sl-SN-FieldLengthAM-r16 SN-FieldLengthAM OPTIONAL, -- Need M

...

},

sl-UM-Bi-Directional-RLC-r16 SEQUENCE {

sl-SN-FieldLengthUM-r16 SN-FieldLengthUM OPTIONAL, -- Need M

...

},

sl-UM-Uni-Directional-RLC-r16 SEQUENCE {

sl-SN-FieldLengthUM-r16 SN-FieldLengthUM OPTIONAL, -- Need M

...

}

}

SL-LogicalChannelConfigPC5-r16 ::= SEQUENCE {

sl-LogicalChannelIdentity-r16 LogicalChannelIdentity,

...

}

SL-PQFI-r16 ::= INTEGER (1..64)

SL-CSI-RS-Config-r16 ::= SEQUENCE {

sl-CSI-RS-FreqAllocation-r16 CHOICE {

sl-OneAntennaPort-r16 BIT STRING (SIZE (12)),

sl-TwoAntennaPort-r16 BIT STRING (SIZE (6))

} OPTIONAL, -- Need M

sl-CSI-RS-FirstSymbol-r16 INTEGER (3..12) OPTIONAL, -- Need M

...

}

-- TAG-RRCRECONFIGURATIONSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCReconfigurationSidelink* field descriptions** |
| ***sl-CSI-RS-FreqAllocation***  Indicates the frequency domain position for sidelink CSI-RS. |
| ***sl-CSI-RS-FirstSymbol***  Indicates the position of first symbol of sidelink CSI-RS. |
| ***sl-Resetconfig***  Indicates that the full configuration should be applicable for the *RRCReconfigurationSidelink* message. |
| ***sl-LatencyBoundCSI-Report***  Indicate the latency bound of SL CSI report from the associated SL CSI triggering in terms of number of slots. |
| ***sl-LogicalChannelIdentity***  Indicates the identity of the sidelink logical channel. |
| ***sl-MappedQoS-FlowsToAddList***  Indicate the QoS flows to be mapped to the configured sidelink DRB. Each entry is indicated by the SL-PQFI, which is used between UEs, as defined in TS 23.287 [55]. |
| ***sl-MappedQoS-FlowsToReleaseList***  Indicate the QoS flows to be released from the configured sidelink DRB. Each entry is indicated by the SL-PQFI, which is used between UEs, as defined in TS 23.287 [55]. |
| ***sl-MeasConfig***  Indicates the sidelink measurement configuration for the unicast destination. |
| ***sl-OutOfOrderDelivery***  Indicates whether or not outOfOrderDelivery specified in TS 38.323 [5] is configured. This field should be either always present or always absent, after the sidelink radio bearer is established. |
| ***sl-PDCP-SN-Size***  Indicates the PDCP SN size of the configured sidelink DRB. |
| ***sl-SDAP-Header***  Indicates whether or not a SDAP header is present on this sidelink DRB. |

– *RRCReconfigurationCompleteSidelink*

The *RRCReconfigurationCompleteSidelink* message is used to confirm the successful completion of a PC5 RRC AS reconfiguration. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***RRCReconfigurationCompleteSidelink* message**

-- ASN1START

-- TAG-RRCRECONFIGURATIONCOMPLETESIDELINK-START

RRCReconfigurationCompleteSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationCompleteSidelink-r16 RRCReconfigurationCompleteSidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationCompleteSidelink-IEs-r16 ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRECONFIGURATIONCOMPLETESIDELINK-STOP

-- ASN1STOP

– *RRCReconfigurationFailureSidelink*

The *RRCReconfigurationFailureSidelink* message is used to indicate the failure of a PC5 RRC AS reconfiguration. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***RRCReconfigurationFailureSidelink* message**

-- ASN1START

-- TAG-RRCRECONFIGURATIONFAILURESIDELINK-START

RRCReconfigurationFailureSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationFailureSidelink-r16 RRCReconfigurationFailureSidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationFailureSidelink-IEs-r16 ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRECONFIGURATIONFAILURESIDELINK-STOP

-- ASN1STOP

– *UECapabilityEnquirySidelink*

The *UECapabilityEnquirySidelink* message is used to request UE sidelink capabilities. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***UECapabilityEnquirySidelink* information element**

-- ASN1START

-- TAG-UECAPABILITYENQUIRYSIDELINK-START

UECapabilityEnquirySidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueCapabilityEnquirySidelink-r16 UECapabilityEnquirySidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityEnquirySidelink-IEs-r16 ::= SEQUENCE {

frequencyBandListFilterSidelink-r16 FreqBandList OPTIONAL, -- Need N

ue-CapabilityInformationSidelink-r16 OCTET STRING OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-UECAPABILITYENQUIRYSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| ***UECapabilityEnquirySidelink-IEs* field descriptions** |
| ***ue-CapabilityInformationSidelink***  This field indicates the *UECapabilityInformationSidelink* message to provide the UE sidelink capability, which can be optionally sent together with *UECapabilityEnquirySidelink*. |

– *UECapabilityInformationSidelink*

The IE *UECapabilityInformationSidelink* message is used to transfer UE radio access capabilities. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

***UECapabilityInformationSidelink* information element**

-- ASN1START

-- TAG-UECAPABILITYINFORMATIONSIDELINK-START

UECapabilityInformationSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueCapabilityInformationSidelink-r16 UECapabilityInformationSidelink-IEs-r16,

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityInformationSidelink-IEs-r16 ::= SEQUENCE {

accessStratumReleaseSidelink-r16 AccessStratumReleaseSidelink-r16,

pdcp-ParametersSidelink-r16 PDCP-ParametersSidelink-r16 OPTIONAL,

rlc-ParametersSidelink-r16 RLC-ParametersSidelink-r16 OPTIONAL,

supportedBandCombinationListSidelinkNR-r16 BandCombinationListSidelinkNR-r16 OPTIONAL,

supportedBandListSidelink-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelink-r16 OPTIONAL,

appliedFreqBandListFilter-r16 FreqBandList OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

AccessStratumReleaseSidelink-r16 ::= ENUMERATED { rel16, spare7, spare6, spare5, spare4, spare3, spare2, spare1, ... }

PDCP-ParametersSidelink-r16 ::= SEQUENCE {

outOfOrderDeliverySidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

RLC-ParametersSidelink-r16 ::= SEQUENCE {

am-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

um-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

BandCombinationListSidelinkNR-r16 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkNR-r16

BandCombinationParametersSidelinkNR-r16 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelink-r16

BandSidelink-r16 ::= SEQUENCE {

freqBandSidelink-r16 FreqBandIndicatorNR,

--15-1

sl-Reception-r16 SEQUENCE {

harq-RxProcessSidelink-r16 ENUMERATED {n16, n24, n32, n64},

pscch-RxSidelink-r16 ENUMERATED {value1, value2},

scs-CP-PatternRxSidelink-r16 CHOICE {

fr1-r16 SEQUENCE {

scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r16 SEQUENCE {

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

}

} OPTIONAL,

extendedCP-RxSidelink-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-10

sl-Tx-256QAM-r16 ENUMERATED {supported} OPTIONAL,

--15-12

lowSE-64QAM-MCS-TableSidelink-r16 ENUMERATED {supported} OPTIONAL,

...,

[[

--15-14

csi-ReportSidelink-r16 SEQUENCE {

csi-RS-PortsSidelink-r16 ENUMERATED {p1, p2}

} OPTIONAL,

--15-19

rankTwoReception-r16 ENUMERATED {supported} OPTIONAL,

--15-23

sl-openLoopPC-RSRP-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

--13-1

sl-Rx-256QAM-r16 ENUMERATED {supported} OPTIONAL

]]

}

-- TAG-UECAPABILITYINFORMATIONSIDELINK-STOP

-- ASN1STOP

– *End of PC5-RRC-Definitions*

-- ASN1START

END

-- ASN1STOP

*End of Change*