**3GPP TSG-RAN WG2 Meeting #124 *R2-2313XXX***

**Chicago, USA, November 13 - 17, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Introduction of SL relay enhancement |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_SL\_relay\_enh-Core |  | ***Date:*** | 2023-11-23 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Introduction of REl-18 SL relay enhancement capabilities |
|  |  |
| ***Summary of change:*** | In 6.3.3, new UE capability parameters for U2U relay discovery/communication, L2 U2N relay service continuity and multi-path relay scenario 1 and scenario 2 are added as below:***supportedBandCombListPerBC-SL-U2URelayDiscovery, supportedBandCombinationListSL-U2URelayDiscovery***,***relayUE-U2UOperation-L2***, ***remoteUE-U2UOperation-L2***,***remoteUE-U2NOperation-L2***,***multipathRelayUE-PC5-L2***, ***multipathRemoteUE-PC5-L2***, ***multipathRelayUE-N3C***, ***multipathRemoteUE-N3C***, ***remoteUE-indirectPathAddChangeToIdleInactiveRelay***, ***pdcp-DuplicationMoreThanOneUuRLC*** In 6.3.3, FS L1 features in *BandCombinationListSL-Discovery-17* is applied for *BandCombinationListSL-U2URelayDiscovery.* In 5.6.1.4, apply ‘*sidelinkRequested*’ filter to *supportedBandCombinationListSL-U2URelayDiscovery.* |
|  |  |
| ***Consequences if not approved:*** | Rel-18 sidelink relay feature is not completed. |
|  |  |
| ***Clauses affected:*** | 5.6.1.4, 6.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS/TR 38.306 |
| ***affected:*** |  | **xx** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

START OF CHANGES

#### 5.6.1.4 Setting band combinations, feature set combinations and feature sets supported by the UE

The UE invokes the procedures in this clause if the NR or E-UTRA network requests UE capabilities for *nr*, *eutra-nr* or *eutra*. This procedure is invoked once per requested *rat-Type* (see clause 5.6.1.3 for capability enquiry by the NR network; see TS 36.331 [10], clause 5.6.3.3 for capability enquiry by the E-UTRA network). The UE shall ensure that the feature set IDs are consistent across feature sets, feature set combinations and band combinations in all three UE capability containers that the network queries with the same fields with the same values, i.e. *UE-CapabilityRequestFilterNR,* *UE-CapabilityRequestFilterCommon* and fields in *UECapabilityEnquiry* message (i.e. *requestedFreqBandsNR-MRDC, requestedCapabilityNR, eutra-nr-only* flag, and *requestedCapabilityCommon*)as defined in TS 36.331, where applicable.

NOTE 1: Capability enquiry without *frequencyBandListFilter* is not supported.

NOTE 2: In (NG)EN-DC, the gNB needs the capabilities for RAT types *nr* and *eutra-nr* and it uses the *featureSets* in the *UE-NR-Capability* together with the *featureSetCombinations* in the *UE-MRDC-Capability* to determine the NR UE capabilities for the supported MRDC band combinations. Similarly, the eNB needs the capabilities for RAT types *eutra* and *eutra-nr* and it uses the *featureSetsEUTRA* in the *UE-EUTRA-Capability* together with the *featureSetCombinations* in the *UE-MRDC-Capability* to determine the E-UTRA UE capabilities for the supported MRDC band combinations. Hence, the IDs used in the *featureSets* must match the IDs referred to in *featureSetCombinations* across all three containers. The requirement on consistency implies that there are no undefined feature sets and feature set combinations.

NOTE 3: If the UE cannot include all feature sets and feature set combinations due to message size or list size constraints, it is up to UE implementation which feature sets and feature set combinations it prioritizes.

The UE shall:

1> compile a list of "candidate band combinations" according to the filter criteria in *capabilityRequestFilterCommon* (if included), only consisting of bands included in *frequencyBandListFilter*, and prioritized in the order of *frequencyBandListFilter* (i.e. first include band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on), where for each band in the band combination, the parameters of the band do not exceed *maxBandwidthRequestedDL*, *maxBandwidthRequestedUL*, *maxCarriersRequestedDL*, *maxCarriersRequestedUL*, *ca-BandwidthClassDL-EUTRA* or *ca-BandwidthClassUL-EUTRA*, whichever are received;

1> for each band combination included in the list of "candidate band combinations":

2> if the network (E-UTRA) included the *eutra-nr-only* field, or

2> if the requested *rat-Type* is *eutra*:

3> remove the NR-only band combination from the list of "candidate band combinations";

NOTE 4: The (E-UTRA) network may request capabilities for *nr* but indicate with the *eutra-nr-only* flag that the UE shall not include any NR band combinations in the *UE-NR-Capability*. In this case the procedural text above removes all NR-only band combinations from the candidate list and thereby also avoids inclusion of corresponding feature set combinations and feature sets below.

2> if it is regarded as a fallback band combination with the same capabilities of another band combination included in the list of "candidate band combinations", and

2> if this fallback band combination is generated by releasing at least one SCell or uplink configuration of SCell or SUL according to TS 38.306 [26]:

3> remove the band combination from the list of "candidate band combinations";

NOTE 5: Even if the network requests (only) capabilities for *nr*, it may include E-UTRA band numbers in the *frequencyBandListFilter* to ensure that the UE includes all necessary feature sets needed for subsequently requested *eutra-nr* capabilities. At this point of the procedure the list of "candidate band combinations" contains all NR- and/or E-UTRA-NR band combinations that match the filter (*frequencyBandListFilter*) provided by the NW and that match the *eutra-nr-only* flag (if RAT-Type *nr* is requested by E-UTRA). In the following, this candidate list is used to derive the band combinations, feature set combinations and feature sets to be reported in the requested capability container.

1> if the requested *rat-Type* is *nr*:

2> include into *supportedBandCombinationList* as many NR-only band combinations as possible from the list of "candidate band combinations", starting from the first entry;

3> if *srs-SwitchingTimeRequest* is received:

4> if SRS carrier switching is supported;

5> include *srs-SwitchingTimesListNR* and *srs-SwitchingAffectedBandsListNR* for each band combination;

4> set *srs-SwitchingTimeRequested* to *true*;

2> include, into *featureSetCombinations*, the feature set combinations referenced from the supported band combinations as included in *supportedBandCombinationList* according to the previous;

2> compile a list of "candidate feature set combinations" referenced from the list of "candidate band combinations" excluding entries (rows in feature set combinations) with same or lower capabilities;

2> if *uplinkTxSwitchRequest* is received:

3> include into *supportedBandCombinationList-UplinkTxSwitch* as many NR-only band combinations that supported UL TX switching as possible from the list of "candidate band combinations", starting from the first entry;

4> if *srs-SwitchingTimeRequest* is received:

5> if SRS carrier switching is supported;

6> include *srs-SwitchingTimesListNR* and *srs-SwitchingAffectedBandsListNR* for each band combination;

5> set *srs-SwitchingTimeRequested* to *true*;

3> include, into *featureSetCombinations*, the feature set combinations referenced from the supported band combinations as included in s*upportedBandCombinationList-UplinkTxSwitch* according to the previous;

NOTE 6: This list of "candidate feature set combinations" contains the feature set combinations used for NR-only as well as E-UTRA-NR band combinations. It is used to derive a list of NR feature sets referred to from the feature set combinations in the *UE-NR-Capability* and from the feature set combinations in a *UE-MRDC-Capability* container.

2> if *sidelinkRequest* is received:

3> for a sidelink band combination the UE included in *supportedBandCombinationListSidelinkEUTRA-NR*, *supportedBandCombinationListSL-RelayDiscovery, supportedBandCombinationListSL-U2URelayDiscovery* or *supportedBandCombinationListSL-NonRelayDiscovery*:

4> if the UE supports partial sensing for a band of the sidelink band combination, include the partial sensing capabilities for the band using the *sl-TransmissionMode2-PartialSensing-r17*;

3> set *sidelinkRequested* to *true*;

2> include into *featureSets* the feature sets referenced from the "candidate feature set combinations" and may exclude the feature sets with the parameters that exceed any of *maxBandwidthRequestedDL*, *maxBandwidthRequestedUL*, *maxCarriersRequestedDL* or *maxCarriersRequestedUL*, whichever are received;

1> else, if the requested *rat-Type* is *eutra-nr*:

2> include into *supportedBandCombinationList* and/or *supportedBandCombinationListNEDC-Only* as many E-UTRA-NR band combinations as possible from the list of "candidate band combinations", starting from the first entry;

3> if *srs-SwitchingTimeRequest* is received:

4> if SRS carrier switching is supported;

5> include *srs-SwitchingTimesListNR*, *srs-SwitchingTimesListEUTRA* and *srs-SwitchingAffectedBandsListNR* for each band combination;

4> set *srs-SwitchingTimeRequested* to *true*;

2> include, into *featureSetCombinations*, the feature set combinations referenced from the supported band combinations as included in *supportedBandCombinationList* according to the previous;

2> if *uplinkTxSwitchRequest* is received:

3> include into *supportedBandCombinationList-UplinkTxSwitch* as many E-UTRA-NR band combinations that supported UL TX switching as possible from the list of "candidate band combinations", starting from the first entry;

4> if *srs-SwitchingTimeRequest* is received:

5> if SRS carrier switching is supported;

6> include *srs-SwitchingTimesListNR*, *srs-SwitchingTimesListEUTRA* and *srs-SwitchingAffectedBandsListNR* for each band combination;

5> set *srs-SwitchingTimeRequested* to *true*;

3> include, into *featureSetCombinations*, the feature set combinations referenced from the supported band combinations as included in *supportedBandCombinationList-UplinkTxSwitch* according to the previous;

1> else (if the requested *rat-Type* is *eutra*):

2> compile a list of "candidate feature set combinations" referenced from the list of "candidate band combinations" excluding entries (rows in feature set combinations) with same or lower capabilities;

NOTE 7: This list of "candidate feature set combinations" contains the feature set combinations used for E-UTRA-NR band combinations. It is used to derive a list of E-UTRA feature sets referred to from the feature set combinations in a *UE-MRDC-Capability* container.

2> include into *featureSetsEUTRA* (in the *UE-EUTRA-Capability*) the feature sets referenced from the "candidate feature set combinations" and may exclude the feature sets with the parameters that exceed *ca-BandwidthClassDL-EUTRA* or *ca-BandwidthClassUL-EUTRA*, whichever are received;

1> include the received *frequencyBandListFilter* in the field *appliedFreqBandListFilter* of the requested UE capability, except if the requested *rat-Type* is *nr* andthe network included the *eutra-nr-only* field;

1> if the network included *ue-CapabilityEnquiryExt*:

2> include the received *ue-CapabilityEnquiryExt* in the field *receivedFilters*;

NEXT CHANGE

### 6.3.3 UE capability information elements

(omitted)

#### – *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-v15g0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v15g0

BandCombinationList-v15n0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v15n0

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

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

BandCombinationList-v1640 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1640

BandCombinationList-v1650 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1650

BandCombinationList-v1680 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1680

BandCombinationList-v1690 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1690

BandCombinationList-v16a0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v16a0

BandCombinationList-v1700 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1700

BandCombinationList-v1720 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1720

BandCombinationList-v1730 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1730

BandCombinationList-v1740 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1740

BandCombinationList-v1760 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1760

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

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

BandCombinationList-UplinkTxSwitch-v1640 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1640

BandCombinationList-UplinkTxSwitch-v1650 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1650

BandCombinationList-UplinkTxSwitch-v1670 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1670

BandCombinationList-UplinkTxSwitch-v1690 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1690

BandCombinationList-UplinkTxSwitch-v16a0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v16a0

BandCombinationList-UplinkTxSwitch-v16e0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v16e0

BandCombinationList-UplinkTxSwitch-v1700 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1700

BandCombinationList-UplinkTxSwitch-v1720 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1720

BandCombinationList-UplinkTxSwitch-v1730 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1730

BandCombinationList-UplinkTxSwitch-v1740 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1740

BandCombinationList-UplinkTxSwitch-v1760 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1760

BandCombination ::= SEQUENCE {

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

 featureSetCombination FeatureSetCombinationId,

 ca-ParametersEUTRA CA-ParametersEUTRA OPTIONAL,

 ca-ParametersNR CA-ParametersNR OPTIONAL,

 mrdc-Parameters MRDC-Parameters OPTIONAL,

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

 powerClass-v1530 ENUMERATED {pc2} OPTIONAL

}

BandCombination-v1540::= SEQUENCE {

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

 ca-ParametersNR-v1540 CA-ParametersNR-v1540 OPTIONAL

}

BandCombination-v1550 ::= SEQUENCE {

 ca-ParametersNR-v1550 CA-ParametersNR-v1550

}

BandCombination-v1560::= SEQUENCE {

 ne-DC-BC ENUMERATED {supported} OPTIONAL,

 ca-ParametersNRDC CA-ParametersNRDC OPTIONAL,

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

 ca-ParametersNR-v1560 CA-ParametersNR-v1560 OPTIONAL

}

BandCombination-v1570 ::= SEQUENCE {

 ca-ParametersEUTRA-v1570 CA-ParametersEUTRA-v1570

}

BandCombination-v1580 ::= SEQUENCE {

 mrdc-Parameters-v1580 MRDC-Parameters-v1580

}

BandCombination-v1590::= SEQUENCE {

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

 mrdc-Parameters-v1590 MRDC-Parameters-v1590

}

BandCombination-v15g0::= SEQUENCE {

 ca-ParametersNR-v15g0 CA-ParametersNR-v15g0 OPTIONAL,

 ca-ParametersNRDC-v15g0 CA-ParametersNRDC-v15g0 OPTIONAL,

 mrdc-Parameters-v15g0 MRDC-Parameters-v15g0 OPTIONAL

}

BandCombination-v15n0::= SEQUENCE {

 mrdc-Parameters-v15n0 MRDC-Parameters-v15n0

}

BandCombination-v1610 ::= SEQUENCE {

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

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

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

 powerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

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

 featureSetCombinationDAPS-r16 FeatureSetCombinationId OPTIONAL,

 mrdc-Parameters-v1620 MRDC-Parameters-v1620 OPTIONAL

}

BandCombination-v1630 ::= SEQUENCE {

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

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

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

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

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

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

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

}

BandCombination-v1640 ::= SEQUENCE {

 ca-ParametersNR-v1640 CA-ParametersNR-v1640 OPTIONAL,

 ca-ParametersNRDC-v1640 CA-ParametersNRDC-v1640 OPTIONAL

}

BandCombination-v1650 ::= SEQUENCE {

 ca-ParametersNRDC-v1650 CA-ParametersNRDC-v1650 OPTIONAL

}

BandCombination-v1680 ::= SEQUENCE {

 intrabandConcurrentOperationPowerClass-r16 SEQUENCE (SIZE (1..maxBandComb)) OF IntraBandPowerClass-r16 OPTIONAL

}

BandCombination-v1690 ::= SEQUENCE {

 ca-ParametersNR-v1690 CA-ParametersNR-v1690 OPTIONAL

}

BandCombination-v16a0 ::= SEQUENCE {

 ca-ParametersNR-v16a0 CA-ParametersNR-v16a0 OPTIONAL,

 ca-ParametersNRDC-v16a0 CA-ParametersNRDC-v16a0 OPTIONAL

}

BandCombination-v1700 ::= SEQUENCE {

 ca-ParametersNR-v1700 CA-ParametersNR-v1700 OPTIONAL,

 ca-ParametersNRDC-v1700 CA-ParametersNRDC-v1700 OPTIONAL,

 mrdc-Parameters-v1700 MRDC-Parameters-v1700 OPTIONAL,

 bandList-v1710 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1710 OPTIONAL,

 supportedBandCombListPerBC-SL-RelayDiscovery-r17 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

 supportedBandCombListPerBC-SL-NonRelayDiscovery-r17 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL

}

BandCombination-v1720 ::= SEQUENCE {

 ca-ParametersNR-v1720 CA-ParametersNR-v1720 OPTIONAL,

 ca-ParametersNRDC-v1720 CA-ParametersNRDC-v1720 OPTIONAL

}

BandCombination-v1730 ::= SEQUENCE {

 ca-ParametersNR-v1730 CA-ParametersNR-v1730 OPTIONAL,

 ca-ParametersNRDC-v1730 CA-ParametersNRDC-v1730 OPTIONAL,

 bandList-v1730 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1730 OPTIONAL

}

BandCombination-v1740 ::= SEQUENCE {

 ca-ParametersNR-v1740 CA-ParametersNR-v1740 OPTIONAL

}

BandCombination-v1760 ::= SEQUENCE {

 ca-ParametersNR-v1760 CA-ParametersNR-v1760,

 ca-ParametersNRDC-v1760 CA-ParametersNRDC-v1760

}

BandCombination-v1800 ::= SEQUENCE {

supportedBandCombListPerBC-SL-U2URelayDiscovery-r18 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,

 ...,

 [[

 -- R4 16-5 UL-MIMO coherence capability for dynamic Tx switching between 3CC 1Tx-2Tx switching

 uplinkTxSwitching-PUSCH-TransCoherence-r16 ENUMERATED {nonCoherent, fullCoherent} OPTIONAL

 ]]

}

BandCombination-UplinkTxSwitch-v1630 ::= SEQUENCE {

 bandCombination-v1630 BandCombination-v1630 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1640 ::= SEQUENCE {

 bandCombination-v1640 BandCombination-v1640 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1650 ::= SEQUENCE {

 bandCombination-v1650 BandCombination-v1650 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1670 ::= SEQUENCE {

 bandCombination-v15g0 BandCombination-v15g0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1690 ::= SEQUENCE {

 bandCombination-v1690 BandCombination-v1690 OPTIONAL

}

BandCombination-UplinkTxSwitch-v16a0 ::= SEQUENCE {

 bandCombination-v16a0 BandCombination-v16a0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v16e0 ::= SEQUENCE {

 bandCombination-v15n0 BandCombination-v15n0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1700 ::= SEQUENCE {

 bandCombination-v1700 BandCombination-v1700 OPTIONAL,

 -- R4 16-1/16-2/16-3 Dynamic Tx switching between 2CC/3CC 2Tx-2Tx/1Tx-2Tx switching

 supportedBandPairListNR-v1700 SEQUENCE (SIZE (1..maxULTxSwitchingBandPairs)) OF ULTxSwitchingBandPair-v1700 OPTIONAL,

 -- R4 16-6: UL-MIMO coherence capability for dynamic Tx switching between 2Tx-2Tx switching

 uplinkTxSwitchingBandParametersList-v1700 SEQUENCE (SIZE (1.. maxSimultaneousBands)) OF UplinkTxSwitchingBandParameters-v1700 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1720 ::= SEQUENCE {

 bandCombination-v1720 BandCombination-v1720 OPTIONAL,

 uplinkTxSwitching-OptionSupport2T2T-r17 ENUMERATED {switchedUL, dualUL, both} OPTIONAL

}

BandCombination-UplinkTxSwitch-v1730 ::= SEQUENCE {

 bandCombination-v1730 BandCombination-v1730 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1740 ::= SEQUENCE {

 bandCombination-v1740 BandCombination-v1740 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1760 ::= SEQUENCE {

 bandCombination-v1760 BandCombination-v1760 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

}

ULTxSwitchingBandPair-v1700 ::= SEQUENCE {

 uplinkTxSwitchingPeriod2T2T-r17 ENUMERATED {n35us, n140us, n210us} OPTIONAL

}

UplinkTxSwitchingBandParameters-v1700 ::= SEQUENCE {

 bandIndex-r17 INTEGER(1..maxSimultaneousBands),

 uplinkTxSwitching2T2T-PUSCH-TransCoherence-r17 ENUMERATED {nonCoherent, fullCoherent} 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

}

BandParameters-v1710 ::= SEQUENCE {

 -- R1 23-8-3 SRS Antenna switching for >4Rx

 srs-AntennaSwitchingBeyond4RX-r17 SEQUENCE {

 -- 1. Support of SRS antenna switching xTyR with y>4

 supportedSRS-TxPortSwitchBeyond4Rx-r17 BIT STRING (SIZE (11)),

 -- 2. Report the entry number of the first-listed band with UL in the band combination that affects this DL

 entryNumberAffectBeyond4Rx-r17 INTEGER (1..32) OPTIONAL,

 -- 3. Report the entry number of the first-listed band with UL in the band combination that switches together with this UL

 entryNumberSwitchBeyond4Rx-r17 INTEGER (1..32) OPTIONAL

 } OPTIONAL

}

BandParameters-v1730 ::= SEQUENCE {

 -- R1 39-3-2 Affected bands for inter-band CA during SRS carrier switching

 srs-SwitchingAffectedBandsListNR-r17 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingAffectedBandsNR-r17

}

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

IntraBandPowerClass-r16 ::= ENUMERATED {pc2, pc3, spare6, spare5, spare4, spare3, spare2, spare1}

SRS-SwitchingAffectedBandsNR-r17 ::= BIT STRING (SIZE (1..maxSimultaneousBands))

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

|  |
| --- |
| *BandCombination* field descriptions |
| ***BandCombinationList-v1540, BandCombinationList-v1550, BandCombinationList-v1560, BandCombinationList-v1570, BandCombinationList-v1580, BandCombinationList-v1590, BandCombinationList-v15g0, BandCombinationList-v15n0, BandCombinationList-v1610*, *BandCombinationList-v1630*, *BandCombinationList-v1640*, *BandCombinationList-v1650, BandCombinationList-v1680, BandCombinationList-v1690, BandCombinationList-v16a0, BandCombinationList-v1700, BandCombinationList-v1720, BandCombinationList-v1730, BandCombinationList-v1760, BandCombinationList-v1800***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. |
| ***BandCombinationList-UplinkTxSwitch-r16, BandCombinationList-UplinkTxSwitch-v1630, BandCombinationList-UplinkTxSwitch-v1640, BandCombinationList-UplinkTxSwitch-v1650, BandCombinationList-UplinkTxSwitch-v1690, BandCombinationList-UplinkTxSwitch-v16a0, BandCombinationList-UplinkTxSwitch-v16e0, BandCombinationList-UplinkTxSwitch-v1700, BandCombinationList-UplinkTxSwitch-v1720, BandCombinationList-UplinkTxSwitch-v1730, BandCombinationList-UplinkTxSwitch-v1760***The UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList-UplinkTxSwitch-r16*.For the field of *supportedBandCombinationList-UplinkTxSwitch-v1700*, if the UE does not support 2Tx-2Tx switching for a given band combination, the field of *supportedBandPairListNR-v1700* in the corresponding entry is absent. |
| ***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. |
| ***supportedBandPairListNR-r16, supportedBandPairListNR-v1700***Indicates a list of band pair supporting UL Tx switching as defined in TS 38.101-1 [15] for a given band combination.A UE supporting 2Tx-2Tx switching should include both of *supportedBandPairListNR-r16* and *supportedBandPairListNR-v1700*. And the UE shall include the same number of entries listed in the same order as in *supportedBandPairListNR-r16*.If the UE does not support 2Tx-2Tx switching for a given band pair, the field of *uplinkTxSwitchingPeriod2T2T* in the corresponding entry 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. |
| ***uplinkTxSwitchingBandParametersList-v1700***Indicates a list of per band per band combination capabilities for UL Tx switching. |

(omitted)

#### – *RF-Parameters*

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

*RF-Parameters* information element

-- ASN1START

-- TAG-RF-PARAMETERS-START

RF-Parameters ::= SEQUENCE {

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

 supportedBandCombinationList BandCombinationList OPTIONAL,

 appliedFreqBandListFilter FreqBandList OPTIONAL,

 ...,

 [[

 supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL,

 srs-SwitchingTimeRequested ENUMERATED {true} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1550 BandCombinationList-v1550 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1610 BandCombinationList-v1610 OPTIONAL,

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

 supportedBandCombinationList-UplinkTxSwitch-r16 BandCombinationList-UplinkTxSwitch-r16 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1630 BandCombinationList-v1630 OPTIONAL,

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

 supportedBandCombinationList-UplinkTxSwitch-v1630 BandCombinationList-UplinkTxSwitch-v1630 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1640 BandCombinationList-v1640 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1640 BandCombinationList-UplinkTxSwitch-v1640 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1650 BandCombinationList-v1650 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1650 BandCombinationList-UplinkTxSwitch-v1650 OPTIONAL

 ]],

 [[

 extendedBand-n77-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-UplinkTxSwitch-v1670 BandCombinationList-UplinkTxSwitch-v1670 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1680 BandCombinationList-v1680 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1690 BandCombinationList-v1690 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1690 BandCombinationList-UplinkTxSwitch-v1690 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1700 BandCombinationList-v1700 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1700 BandCombinationList-UplinkTxSwitch-v1700 OPTIONAL,

 supportedBandCombinationListSL-RelayDiscovery-r17 OCTET STRING OPTIONAL, -- Contains PC5 BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSL-NonRelayDiscovery-r17 OCTET STRING OPTIONAL, -- Contains PC5 BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSidelinkEUTRA-NR-v1710 BandCombinationListSidelinkEUTRA-NR-v1710 OPTIONAL,

 sidelinkRequested-r17 ENUMERATED {true} OPTIONAL,

 extendedBand-n77-2-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1720 BandCombinationList-v1720 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1720 BandCombinationList-UplinkTxSwitch-v1720 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1730 BandCombinationList-v1730 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1730 BandCombinationList-UplinkTxSwitch-v1730 OPTIONAL,

 supportedBandCombinationListSL-RelayDiscovery-v1730 BandCombinationListSL-Discovery-r17 OPTIONAL,

 supportedBandCombinationListSL-NonRelayDiscovery-v1730 BandCombinationListSL-Discovery-r17 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1740 BandCombinationList-v1740 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1740 BandCombinationList-UplinkTxSwitch-v1740 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1760 BandCombinationList-v1760 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1760 BandCombinationList-UplinkTxSwitch-v1760 OPTIONAL

 ]]

 [[

supportedBandCombinationListSL-U2URelay-r18 ::= SEQUENCE {

supportedBandCombinationListSL-U2URelayDiscovery-r18 OCTET STRING OPTIONAL, -- Contains PC5 BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSL-U2UDiscovery BandCombinationListSL-Discovery-r17 OPTIONAL

}

 ]]

}

RF-Parameters-v15g0 ::= SEQUENCE {

 supportedBandCombinationList-v15g0 BandCombinationList-v15g0 OPTIONAL

}

RF-Parameters-v16a0 ::= SEQUENCE {

 supportedBandCombinationList-v16a0 BandCombinationList-v16a0 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v16a0 BandCombinationList-UplinkTxSwitch-v16a0 OPTIONAL

}

RF-Parameters-v16c0 ::= SEQUENCE {

 supportedBandListNR-v16c0 SEQUENCE (SIZE (1..maxBands)) OF BandNR-v16c0

}

BandNR ::= SEQUENCE {

 bandNR FreqBandIndicatorNR,

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

 mimo-ParametersPerBand MIMO-ParametersPerBand OPTIONAL,

 extendedCP ENUMERATED {supported} OPTIONAL,

 multipleTCI ENUMERATED {supported} OPTIONAL,

 bwp-WithoutRestriction ENUMERATED {supported} OPTIONAL,

 bwp-SameNumerology ENUMERATED {upto2, upto4} OPTIONAL,

 bwp-DiffNumerology ENUMERATED {upto4} OPTIONAL,

 crossCarrierScheduling-SameSCS ENUMERATED {supported} OPTIONAL,

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

 pusch-256QAM ENUMERATED {supported} OPTIONAL,

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

 rateMatchingLTE-CRS ENUMERATED {supported} OPTIONAL,

 channelBWs-DL CHOICE {

 fr1 SEQUENCE {

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

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

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

 },

 fr2 SEQUENCE {

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

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

 }

 } OPTIONAL,

 channelBWs-UL CHOICE {

 fr1 SEQUENCE {

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

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

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

 },

 fr2 SEQUENCE {

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

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

 }

 } OPTIONAL,

 ...,

 [[

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

 ]],

 [[

 pucch-SpatialRelInfoMAC-CE ENUMERATED {supported} OPTIONAL,

 powerBoosting-pi2BPSK ENUMERATED {supported} OPTIONAL

 ]],

 [[

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

 ]],

 [[

 channelBWs-DL-v1590 CHOICE {

 fr1 SEQUENCE {

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

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

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

 },

 fr2 SEQUENCE {

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

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

 }

 } OPTIONAL,

 channelBWs-UL-v1590 CHOICE {

 fr1 SEQUENCE {

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

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

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

 },

 fr2 SEQUENCE {

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

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

 }

 } OPTIONAL

 ]],

 [[

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

 ]],

 [[

 -- R1 10: NR-unlicensed

 sharedSpectrumChAccessParamsPerBand-r16 SharedSpectrumChAccessParamsPerBand-r16 OPTIONAL,

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

 cancelOverlappingPUSCH-r16 ENUMERATED {supported} OPTIONAL,

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

 multipleRateMatchingEUTRA-CRS-r16 SEQUENCE {

 maxNumberPatterns-r16 INTEGER (2..6),

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

 } OPTIONAL,

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

 overlapRateMatchingEUTRA-CRS-r16 ENUMERATED {supported} OPTIONAL,

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

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

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

 oneSlotPeriodicTRS-r16 ENUMERATED {supported} OPTIONAL,

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

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

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

 channelBW-DL-IAB-r16 CHOICE {

 fr1-100mhz SEQUENCE {

 scs-15kHz ENUMERATED {supported} OPTIONAL,

 scs-30kHz ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL

 },

 fr2-200mhz SEQUENCE {

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 scs-120kHz ENUMERATED {supported} OPTIONAL

 }

 } OPTIONAL,

 channelBW-UL-IAB-r16 CHOICE {

 fr1-100mhz SEQUENCE {

 scs-15kHz ENUMERATED {supported} OPTIONAL,

 scs-30kHz ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL

 },

 fr2-200mhz SEQUENCE {

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 scs-120kHz ENUMERATED {supported} OPTIONAL

 }

 } OPTIONAL,

 rasterShift7dot5-IAB-r16 ENUMERATED {supported} OPTIONAL,

 ue-PowerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

 condHandover-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverFailure-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

 condPSCellChange-r16 ENUMERATED {supported} OPTIONAL,

 condPSCellChangeTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

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

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

 activeConfiguredGrant-r16 SEQUENCE {

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

 maxNumberConfigsAllCC-r16 INTEGER (2..32)

 } OPTIONAL,

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

 jointReleaseConfiguredGrantType2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-2: Multiple SPS configurations

 sps-r16 SEQUENCE {

 maxNumberConfigsPerBWP-r16 INTEGER (1..8),

 maxNumberConfigsAllCC-r16 INTEGER (2..32)

 } OPTIONAL,

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

 jointReleaseSPS-r16 ENUMERATED {supported} OPTIONAL,

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

 simulSRS-TransWithinBand-r16 ENUMERATED {n2} OPTIONAL,

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

 handoverIntraF-IAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

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

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

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

 -- R1 10: NR-unlicensed

 sharedSpectrumChAccessParamsPerBand-v1630 SharedSpectrumChAccessParamsPerBand-v1630 OPTIONAL

 ]],

 [[

 handoverUTRA-FDD-r16 ENUMERATED {supported} OPTIONAL,

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

 enhancedUL-TransientPeriod-r16 ENUMERATED {us2, us4, us7} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1640 SharedSpectrumChAccessParamsPerBand-v1640 OPTIONAL

 ]],

 [[

 type1-PUSCH-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 type2-PUSCH-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 pusch-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType1-v1650 ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType2-v1650 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1650 SharedSpectrumChAccessParamsPerBand-v1650 OPTIONAL

 ]],

 [[

 enhancedSkipUplinkTxConfigured-v1660 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxDynamic-v1660 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 maxUplinkDutyCycle-PC1dot5-MPE-FR1-r16 ENUMERATED {n10, n15, n20, n25, n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 txDiversity-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 36-1: Support of 1024QAM for PDSCH for FR1

 pdsch-1024QAM-FR1-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 22-1 support of FR2 HST operation

 ue-PowerClass-v1700 ENUMERATED {pc5, pc6, pc7} OPTIONAL,

 -- R1 24: NR extension to 71GHz (FR2-2)

 fr2-2-AccessParamsPerBand-r17 FR2-2-AccessParamsPerBand-r17 OPTIONAL,

 rlm-Relaxation-r17 ENUMERATED {supported} OPTIONAL,

 bfd-Relaxation-r17 ENUMERATED {supported} OPTIONAL,

 cg-SDT-r17 ENUMERATED {supported} OPTIONAL,

 locationBasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 timeBasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 eventA4BasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 mn-InitiatedCondPSCellChangeNRDC-r17 ENUMERATED {supported} OPTIONAL,

 sn-InitiatedCondPSCellChangeNRDC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3a: PDCCH skipping

 pdcch-SkippingWithoutSSSG-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3b: 2 search space sets group switching

 sssg-Switching-1BitInd-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3c: 3 search space sets group switching

 sssg-Switching-2BitInd-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3d: 2 search space sets group switching with PDCCH skipping

 pdcch-SkippingWithSSSG-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3e: Support Search space set group switching capability 2 for FR1

 searchSpaceSetGrp-switchCap2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-1: Uplink Time and Frequency pre-compensation and timing relationship enhancements

 uplinkPreCompensation-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-4: UE reporting of information related to TA pre-compensation

 uplink-TA-Reporting-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-5: Increasing the number of HARQ processes

 max-HARQ-ProcessNumber-r17 ENUMERATED {u16d32, u32d16, u32d32} OPTIONAL,

 -- R1 26-6: Type-2 HARQ codebook enhancement

 type2-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-6a: Type-1 HARQ codebook enhancement

 type1-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-6b: Type-3 HARQ codebook enhancement

 type3-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-9: UE-specific K\_offset

 ue-specific-K-Offset-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1f: Multiple PDSCH scheduling by single DCI for 120kHz in FR2-1

 multiPDSCH-SingleDCI-FR2-1-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1g: Multiple PUSCH scheduling by single DCI for 120kHz in FR2-1

 multiPUSCH-SingleDCI-FR2-1-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 14-4: Parallel PRS measurements in RRC\_INACTIVE state, FR1/FR2 diff

 parallelPRS-MeasRRC-Inactive-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-1-2: Support of UE-TxTEGs for UL TDOA

 nr-UE-TxTEG-ID-MaxSupport-r17 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL,

 -- R1 27-17: PRS processing in RRC\_INACTIVE

 prs-ProcessingRRC-Inactive-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-3-2: DL PRS measurement outside MG and in a PRS processing window

 prs-ProcessingWindowType1A-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType1B-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType2-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 -- R1 27-15: Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP

 srs-AllPosResourcesRRC-Inactive-r17 SRS-AllPosResourcesRRC-Inactive-r17 OPTIONAL,

 -- R1 27-16: OLPC for positioning SRS in RRC\_INACTIVE state - gNB

 olpc-SRS-PosRRC-Inactive-r17 OLPC-SRS-Pos-r16 OPTIONAL,

 -- R1 27-19: Spatial relation for positioning SRS in RRC\_INACTIVE state - gNB

 spatialRelationsSRS-PosRRC-Inactive-r17 SpatialRelationsSRS-Pos-r16 OPTIONAL,

 -- R1 30-1: Increased maximum number of PUSCH Type A repetitions

 maxNumberPUSCH-TypeA-Repetition-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-2: PUSCH Type A repetitions based on available slots

 puschTypeA-RepetitionsAvailSlot-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-3: TB processing over multi-slot PUSCH

 tb-ProcessingMultiSlotPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-3a: Repetition of TB processing over multi-slot PUSCH

 tb-ProcessingRepMultiSlotPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4: The maximum duration for DM-RS bundling

 maxDurationDMRS-Bundling-r17 SEQUENCE {

 fdd-r17 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

 tdd-r17 ENUMERATED {n2, n4, n8, n16} OPTIONAL

 } OPTIONAL,

 -- R1 30-6: Repetition of PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI

 pusch-RepetitionMsg3-r17 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1710 SharedSpectrumChAccessParamsPerBand-v1710 OPTIONAL,

 -- R4 25-2: Parallel measurements on cells belonging to a different NGSO satellite than a serving satellite without scheduling restrictions

 -- on normal operations with the serving cell

 parallelMeasurementWithoutRestriction-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 25-5: Parallel measurements on multiple NGSO satellites within a SMTC

 maxNumber-NGSO-SatellitesWithinOneSMTC-r17 ENUMERATED {n1, n2, n3, n4} OPTIONAL,

 -- R1 26-10: K1 range extension

 k1-RangeExtension-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 35-1: Aperiodic CSI-RS for tracking for fast SCell activation

 aperiodicCSI-RS-FastScellActivation-r17 SEQUENCE {

 maxNumberAperiodicCSI-RS-PerCC-r17 ENUMERATED {n8, n16, n32, n48, n64, n128, n255},

 maxNumberAperiodicCSI-RS-AcrossCCs-r17 ENUMERATED {n8, n16, n32, n64, n128, n256, n512, n1024}

 } OPTIONAL,

 -- R1 35-2: Aperiodic CSI-RS bandwidth for tracking for fast SCell activation for 10MHz UE channel bandwidth

 aperiodicCSI-RS-AdditionalBandwidth-r17 ENUMERATED {addBW-Set1, addBW-Set2} OPTIONAL,

 -- R1 28-1a: RRC-configured DL BWP without CD-SSB or NCD-SSB

 bwp-WithoutCD-SSB-OrNCD-SSB-RedCap-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 28-3: Half-duplex FDD operation type A for RedCap UE

 halfDuplexFDD-TypeA-RedCap-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-15b: Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP

 posSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 PosSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 OPTIONAL,

 -- R4 15-3 UE support of CBW for 480kHz SCS

 channelBWs-DL-SCS-480kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-480kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 -- R4 15-4 UE support of CBW for 960kHz SCS

 channelBWs-DL-SCS-960kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-960kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 -- R4 17-1 UL gap for Tx power management

 ul-GapFR2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-4: One-shot HARQ ACK feedback triggered by DCI format 1\_2

 oneShotHARQ-feedbackTriggeredByDCI-1-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-5: PHY priority handling for one-shot HARQ ACK feedback

 oneShotHARQ-feedbackPhy-Priority-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-6: Enhanced type 3 HARQ-ACK codebook feedback

 enhancedType3-HARQ-CodebookFeedback-r17 SEQUENCE {

 enhancedType3-HARQ-Codebooks-r17 ENUMERATED {n1, n2, n4, n8},

 maxNumberPUCCH-Transmissions-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n7}

 } OPTIONAL,

 -- R1 25-7: Triggered HARQ-ACK codebook re-transmission

 triggeredHARQ-CodebookRetx-r17 SEQUENCE {

 minHARQ-Retx-Offset-r17 ENUMERATED {n-7, n-5, n-3, n-1, n1},

 maxHARQ-Retx-Offset-r17 ENUMERATED {n4, n6, n8, n10, n12, n14, n16, n18, n20, n22, n24}

 } OPTIONAL

 ]],

 [[

 -- R4 22-2 support of one shot large UL timing adjustment

 ue-OneShotUL-TimingAdj-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-2: Repetitions for PUCCH format 0, and 2 over multiple slots with K = 2, 4, 8

 pucch-Repetition-F0-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-11a: 4-bits subband CQI for NTN and unlicensed

 cqi-4-BitsSubbandNTN-SharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-16: HARQ-ACK with different priorities multiplexing on a PUCCH/PUSCH

 mux-HARQ-ACK-DiffPriorities-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-20a: Propagation delay compensation based on legacy TA procedure for NTN and unlicensed

 ta-BasedPDC-NTN-SharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2b: DCI-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast

 ack-NACK-FeedbackForMulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2e: Multiple G-RNTIs for group-common PDSCHs

 maxNumberG-RNTI-r17 INTEGER (2..8) OPTIONAL,

 -- R1 33-2f: Dynamic multicast with DCI format 4\_2

 dynamicMulticastDCI-Format4-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2i: Supported maximal modulation order for multicast PDSCH

 maxModulationOrderForMulticast-r17 CHOICE {

 fr1-r17 ENUMERATED {qam256, qam1024},

 fr2-r17 ENUMERATED {qam64, qam256}

 } OPTIONAL,

 -- R1 33-3-1: Dynamic Slot-level repetition for group-common PDSCH for TN and licensed

 dynamicSlotRepetitionMulticastTN-NonSharedSpectrumChAccess-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-3-1a: Dynamic Slot-level repetition for group-common PDSCH for NTN and unlicensed

 dynamicSlotRepetitionMulticastNTN-SharedSpectrumChAccess-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-4-1: DCI-based enabling/disabling NACK-only based feedback for dynamic scheduling for multicast

 nack-OnlyFeedbackForMulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1b: DCI-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast

 ack-NACK-FeedbackForSPS-MulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1h: Multiple G-CS-RNTIs for SPS group-common PDSCHs

 maxNumberG-CS-RNTI-r17 INTEGER (2..8) OPTIONAL,

 -- R1 33-10: Support group-common PDSCH RE-level rate matching for multicast

 re-LevelRateMatchingForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 36-1a: Support of 1024QAM for PDSCH with maximum 2 MIMO layers for FR1

 pdsch-1024QAM-2MIMO-FR1-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 14-3 PRS measurement without MG

 prs-MeasurementWithoutMG-r17 ENUMERATED {cpLength, quarterSymbol, halfSymbol, halfSlot} OPTIONAL,

 -- R4 25-7: The number of target LEO satellites the UE can monitor per carrier

 maxNumber-LEO-SatellitesPerCarrier-r17 INTEGER (3..4) OPTIONAL,

 -- R1 27-3-3 DL PRS Processing Capability outside MG - buffering capability

 prs-ProcessingCapabilityOutsideMGinPPW-r17 SEQUENCE (SIZE(1..3)) OF PRS-ProcessingCapabilityOutsideMGinPPWperType-r17 OPTIONAL,

 -- R1 27-15a: Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP with semi-persistent SRS

 srs-SemiPersistent-PosResourcesRRC-Inactive-r17 SEQUENCE {

 maxNumOfSemiPersistentSRSposResources-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumOfSemiPersistentSRSposResourcesPerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

 } OPTIONAL,

 -- R2: UE support of CBW for 120kHz SCS

 channelBWs-DL-SCS-120kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-120kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL

 ]],

 [[

 -- R1 30-4a: DM-RS bundling for PUSCH repetition type A

 dmrs-BundlingPUSCH-RepTypeA-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4b: DM-RS bundling for PUSCH repetition type B

 dmrs-BundlingPUSCH-RepTypeB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4c: DM-RS bundling for TB processing over multi-slot PUSCH

 dmrs-BundlingPUSCH-multiSlot-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4d: DMRS bundling for PUCCH repetitions

 dmrs-BundlingPUCCH-Rep-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4e: Enhanced inter-slot frequency hopping with inter-slot bundling for PUSCH

 interSlotFreqHopInterSlotBundlingPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4f: Enhanced inter-slot frequency hopping for PUCCH repetitions with DMRS bundling

 interSlotFreqHopPUCCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4g: Restart DM-RS bundling

 dmrs-BundlingRestart-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4h: DM-RS bundling for non-back-to-back transmission

 dmrs-BundlingNonBackToBackTX-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 33-5-1e: Dynamic Slot-level repetition for SPS group-common PDSCH for multicast

 maxDynamicSlotRepetitionForSPS-Multicast-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-5-1g: DCI-based enabling/disabling NACK-only based feedback for SPS group-common PDSCH for multicast

 nack-OnlyFeedbackForSPS-MulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1i: Multicast SPS scheduling with DCI format 4\_2

 sps-MulticastDCI-Format4-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-2: Multiple SPS group-common PDSCH configuration on PCell

 sps-MulticastMultiConfig-r17 INTEGER (1..8) OPTIONAL,

 -- R1 33-6-1: DL priority indication for multicast in DCI

 priorityIndicatorInDCI-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-1a: DL priority configuration for SPS multicast

 priorityIndicatorInDCI-SPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-2: Two HARQ-ACK codebooks simultaneously constructed for supporting HARQ-ACK codebooks with different priorities

 -- for unicast and multicast at a UE

 twoHARQ-ACK-CodebookForUnicastAndMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-3: More than one PUCCH for HARQ-ACK transmission for multicast or for unicast and multicast within a slot

 multiPUCCH-HARQ-ACK-ForMulticastUnicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-9: Supporting unicast PDCCH to release SPS group-common PDSCH

 releaseSPS-MulticastWithCS-RNTI-r17 ENUMERATED {supported} OPTIONAL

 ]]

}

BandNR-v16c0 ::= SEQUENCE {

 pusch-RepetitionTypeA-v16c0 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]. |
| ***supportedBandCombinationListSidelinkEUTRA-NR***A list of band combinations that the UE supports for NR sidelink communication only, for joint NR sidelink communication and V2X sidelink communication, or for V2X sidelink communication only. The UE does not include this field if the UE capability is requested by E-UTRAN (see TS 36.331[10]) and the network request includes the field *eutra-nr-only*. |
| ***supportedBandCombinationListSL-NonRelayDiscovery***A list of band combinations that the UE supports for NR sidelink non-relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |
| ***supportedBandCombinationListSL-RelayDiscovery***A list of band combinations that the UE supports for NR sidelink relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |
| ***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]. |
| ***supportedBandListNR***A list of NR bands supported by the UE. If *supportedBandListNR-v16c0* is included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandListNR* (without suffix). |
| ***supportedBandCombinationListSL-U2URelayDiscovery***A list of band combinations that the UE supports for NR U2U sidelink relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |

(omitted)

#### – *SidelinkParameters*

The IE *SidelinkParameters* is used to convey capabilities related to NR and V2X 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,

 ...,

 [[

 relayParameters-r17 RelayParameters-r17 OPTIONAL

 ]],

 [[

 -- R1 32-x: Use of new P0 parameters for open loop power control

 p0-OLPC-Sidelink-r17 ENUMERATED {supported} 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,

 ...,

 [[

 drx-OnSidelink-r17 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

 ]],

 [[

 ue-PowerClassSidelink-r16 ENUMERATED {pc2, pc3, spare6, spare5, spare4, spare3, spare2, spare1}

 OPTIONAL

 ]],

 [[

 --32-4a

 sl-TransmissionMode2-RandomResourceSelection-r17 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

 fr1-r17 SEQUENCE {

 scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r17 SEQUENCE {

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-Mode2Random-r17 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4b

 sync-Sidelink-v1710 SEQUENCE {

 sync-GNSS-r17 ENUMERATED {supported} OPTIONAL,

 gNB-Sync-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNSS-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4c

 enb-sync-Sidelink-v1710 ENUMERATED {supported} OPTIONAL,

 --32-5a-2

 rx-IUC-Scheme1-PreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5a-3

 rx-IUC-Scheme1-NonPreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5b-2

 rx-IUC-Scheme2-Mode2Sidelink-r17 ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64} OPTIONAL,

 --32-6-1

 rx-IUC-Scheme1-SCI-r17 ENUMERATED {supported} OPTIONAL,

 --32-6-2

 rx-IUC-Scheme1-SCI-ExplicitReq-r17 ENUMERATED {supported} OPTIONAL

 ]]

}

RelayParameters-r17 ::= SEQUENCE {

 relayUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-PathSwitchToIdleInactiveRelay-r17 ENUMERATED {supported} OPTIONAL,

 ...,

[[

relayUE-U2UOperation-L2-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-U2UOperation-L2-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-U2NOperation-L2-r18 ENUMERATED {supported} OPTIONAL,

multipathRelayUE-PC5-L2-r18 ENUMERATED {supported} OPTIONAL,

multipathRemoteUE-PC5-L2-r18 ENUMERATED {supported} OPTIONAL,

multipathRelayUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

multipathRemoteUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMoreThanOneUuRLC-r18 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. |

(omitted)

END OF CHANGES