**3GPP TSG- WG2 Meeting #131bis** ***R2-2507412***

**Prague, Czech Republic, October 13-17, 2025**

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **draft** | **rev** | **-** | **Current 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 |  | Core Network | **x** |

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|  |
| ***Title:***  | Corrections to DL AI/ML Positioning |
|  |  |
| ***Source to WG:*** |  Qualcomm Incorporated (Rapporteur) |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | -Core |  | ***Date:*** | 2025-10-08 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** |  |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | 1. The IE *NR-DL-PRS-ProcessingCapability-r16* is currently included in *NR-DL-AIML-ProvideCapabilities-r19*. Per latest RAN1 feature list in R1-2506627 (LS in R2-2506710) most (but not all) fields are applicable to DL AI/ML Positioning.
2. The specification has the following Editor's Note in clause 6.4.3 which requires resolution: "It is FFS whether the fields *nr-TRP-LocationInfo* and *nr-TRP-LocationInfo-Implicit* can both be present in IE *NR-PositionCalculationAssistance.*"
3. The *nr-TRP-RequestList* in IE *NR-On-Demand-DL-PRS-Request* is only needed for DL AI/ML Positioning.
 |
|  |  |
| ***Summary of change:*** | 1. The IE *NR-DL-PRS-ProcessingCapability* in IE *NR-DL-AIML-ProvideCapabilities* is replaced by an AI/ML positioning specific version (*NR-DL-AIML-PRS-ProcessingCapability-r19)*, which includes only those PRS processing capabilities relevant to DL AI/ML Positioning.
2. The Editor's Note is deleted since this can be left to implementation/deployment.
3. A NOTE is added to the field description for *nr-TRP-RequestList* indicating that this field is applicable to DL AI/ML Positioning only.
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|  |  |
| ***Consequences if not approved:*** | Errors in the specifications will remain. |
|  |  |
| ***Clauses affected:*** | 6.4.3, 6.5.13.6, 6.5.13.6a (new) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

### 6.4.3 Common NR Positioning Information Elements

[…]

#### *– NR-DL-PRS-ProcessingCapability*

The IE *NR-DL-PRS-ProcessingCapability* defines the common DL-PRS Processing capability. In the case of capabilities for multiple NR positioning methods from amongst DL-TDOA, DL-AoD and Multi-RTT positioning methods are provided, the target device shall indicate the same values for the capabilities in IEs *NR-DL-TDOA-ProvideCapabilities*, *NR-DL-AoD-ProvideCapabilities*, and *NR-Multi-RTT-ProvideCapabilities*.

The *PRS-ProcessingCapabilityPerBand* is defined for a single positioning frequency layer on a certain band (i.e., a target device supporting multiple positioning frequency layers is expected to process one frequency layer at a time).

-- ASN1START

NR-DL-PRS-ProcessingCapability-r16 ::= SEQUENCE {

 prs-ProcessingCapabilityBandList-r16 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF

 PRS-ProcessingCapabilityPerBand-r16,

 maxSupportedFreqLayers-r16 INTEGER (1..4),

 simulLTE-NR-PRS-r16 ENUMERATED { supported } OPTIONAL,

 ...,

 [[

 dummy ENUMERATED { m1, m2, ... } OPTIONAL

 ]]

}

PRS-ProcessingCapabilityPerBand-r16 ::= SEQUENCE {

 freqBandIndicatorNR-r16 FreqBandIndicatorNR-r16,

 supportedBandwidthPRS-r16 CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz20, mhz40,

 mhz50, mhz80, mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400},

 ...

 },

 dl-PRS-BufferType-r16 ENUMERATED {type1, type2, ...},

 durationOfPRS-Processing-r16 SEQUENCE {

 durationOfPRS-ProcessingSymbols-r16 ENUMERATED {nDot125, nDot25, nDot5, n1,

 n2, n4, n6, n8, n12, n16, n20, n25,

 n30, n32, n35, n40, n45, n50},

 durationOfPRS-ProcessingSymbolsInEveryTms-r16

 ENUMERATED {n8, n16, n20, n30, n40, n80,

 n160,n320, n640, n1280},

 ...

 },

 maxNumOfDL-PRS-ResProcessedPerSlot-r16 SEQUENCE {

 scs15-r16 ENUMERATED {n1, n2, n4, n8, n16, n24, n32,

 n48, n64} OPTIONAL,

 scs30-r16 ENUMERATED {n1, n2, n4, n8, n16, n24, n32,

 n48, n64} OPTIONAL,

 scs60-r16 ENUMERATED {n1, n2, n4, n8, n16, n24, n32,

 n48, n64} OPTIONAL,

 scs120-r16 ENUMERATED {n1, n2, n4, n8, n16, n24, n32,

 n48, n64} OPTIONAL,

 ...,

 [[

 scs15-v1690 ENUMERATED {n6, n12} OPTIONAL,

 scs30-v1690 ENUMERATED {n6, n12} OPTIONAL,

 scs60-v1690 ENUMERATED {n6, n12} OPTIONAL,

 scs120-v1690 ENUMERATED {n6, n12} OPTIONAL

 ]]

 },

 ...,

 [[

 supportedDL-PRS-ProcessingSamples-RRC-CONNECTED-r17 ENUMERATED { supported } OPTIONAL,

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

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

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

 prs-ProcessingCapabilityOutsideMGinPPW-r17

 SEQUENCE (SIZE(1..3)) OF

 PRS-ProcessingCapabilityOutsideMGinPPWperType-r17

 OPTIONAL,

 dl-PRS-BufferType-RRC-Inactive-r17 ENUMERATED { type1, type2, ... } OPTIONAL,

 durationOfPRS-Processing-RRC-Inactive-r17 SEQUENCE {

 durationOfPRS-ProcessingSymbols-r17 ENUMERATED {nDot125, nDot25, nDot5, n1,

 n2, n4, n6, n8, n12, n16, n20, n25,

 n30, n32, n35, n40, n45, n50},

 durationOfPRS-ProcessingSymbolsInEveryTms-r17

 ENUMERATED {n8, n16, n20, n30, n40, n80,

 n160,n320, n640, n1280},

 ...

 } OPTIONAL,

 maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive-r17 SEQUENCE {

 scs15-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs30-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs60-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs120-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 ...

 } OPTIONAL,

 supportedLowerRxBeamSweepingFactor-FR2-r17 ENUMERATED { n1, n2, n4, n6 } OPTIONAL

 ]],

 [[

 supportedDL-PRS-ProcessingSamples-RRC-Inactive-r17 ENUMERATED { supported } OPTIONAL

 ]],

 [[

 prs-MeasurementWithoutMG-r17 ENUMERATED {cp, symbolDot25, symbolDot5,

 slotDot5} OPTIONAL

 ]],

 [[

 maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Inactive-r18 SEQUENCE {

 scs15-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs30-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs120-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 ...

 } OPTIONAL,

 maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Connected-r18 SEQUENCE {

 scs15-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs30-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs120-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 ...

 } OPTIONAL,

 ppw-maxNumOfOneSymbolPRS-ResProcessedPerSlot-r18 SEQUENCE {

 scs15-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs30-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs120-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 ...

 } OPTIONAL,

 prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected-r18

 PRS-BWA-TwoContiguousIntrabandInMG-r18 OPTIONAL,

 prs-BWA-ThreeContiguousIntrabandInMG-RRC-Connected-r18

 PRS-BWA-ThreeContiguousIntrabandInMG-r18 OPTIONAL,

 prs-BWA-TwoContiguousIntraband-RRC-IdleAndInactive-r18

 PRS-BWA-TwoContiguousIntrabandInMG-r18 OPTIONAL,

 prs-BWA-ThreeContiguousIntraband-RRC-IdleAndInactive-r18

 PRS-BWA-ThreeContiguousIntrabandInMG-r18 OPTIONAL,

 reducedNumOfSampleInMeasurementWithPRS-BWA-RRC-Connected-r18 ENUMERATED { supported }

 OPTIONAL,

 reducedNumOfSampleInMeasurementWithPRS-BWA-RRC-IdleAndInactive-r18

 ENUMERATED { supported } OPTIONAL,

 dl-PRS-MeasurementWithRxFH-RRC-Inactive-r18 ENUMERATED { supported } OPTIONAL,

 dl-PRS-MeasurementWithRxFH-RRC-Idle-r18 ENUMERATED { supported } OPTIONAL,

 reducedNumOfSampleForMeasurementWithFH-RRC-Connected-r18 ENUMERATED { supported }

 OPTIONAL,

 reducedNumOfSampleForMeasurementWithFH-RRC-IdleAndInactive-r18 ENUMERATED { supported }

 OPTIONAL,

 supportOfPRS-BWA-WithTwoPFL-Combination-r18 ENUMERATED { supported } OPTIONAL,

 dl-PRS-MeasurementWithRxFH-RRC-Connected-r18 DL-PRS-MeasurementWithRxFH-RRC-Connected-r18 OPTIONAL

 ]]

}

PRS-ProcessingCapabilityOutsideMGinPPWperType-r17 ::= SEQUENCE {

 prsProcessingType-r17 ENUMERATED { type1A, type1B, type2 },

 ppw-dl-PRS-BufferType-r17 ENUMERATED { type1, type2, ... },

 ppw-durationOfPRS-Processing1-r17 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN-r17

 ENUMERATED { msDot125, msDot25, msDot5, ms1, ms2, ms4,

 ms6, ms8, ms12, ms16, ms20, ms25, ms30, ms32, ms35,

 ms40, ms45, ms50 },

 ppw-durationOfPRS-ProcessingSymbolsT-r17

 ENUMERATED { ms1, ms2, ms4, ms8, ms16, ms20, ms30, ms40, ms80,

 ms160, ms320, ms640, ms1280 }

 } OPTIONAL,

 ppw-durationOfPRS-Processing2-r17 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN2-r17

 ENUMERATED { msDot125, msDot25, msDot5, ms1, ms2, ms3, ms4, ms5,

 ms6, ms8, ms12 },

 ppw-durationOfPRS-ProcessingSymbolsT2-r17

 ENUMERATED { ms4, ms5, ms6, ms8 }

 } OPTIONAL,

 ppw-maxNumOfDL-PRS-ResProcessedPerSlot-r17 SEQUENCE {

 scs15-r17 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 }

 OPTIONAL,

 scs30-r17 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 }

 OPTIONAL,

 scs60-r17 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 }

 OPTIONAL,

 scs120-r17 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 }

 OPTIONAL,

 ...

 },

 ...,

 [[

 ppw-maxNumOfDL-Bandwidth-r17 CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz20, mhz40,

 mhz50, mhz80, mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 } OPTIONAL

 ]]

}

PRS-BWA-TwoContiguousIntrabandInMG-r18 ::= SEQUENCE {

 maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1-r18 ENUMERATED {mhz10, mhz20, mhz40, mhz50,

 mhz80, mhz100, mhz160, mhz200}

 OPTIONAL,

 maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2-r18 ENUMERATED {mhz100, mhz200, mhz400, mhz800}

 OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR1-r18 ENUMERATED {mhz5, mhz10, mhz20, mhz40,

 mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 OPTIONAL,

 dl-PRS-BufferTypeOfBWA-r18 ENUMERATED {type1, type2},

 prs-durationOfTwoPRS-BWA-Processing-r18 SEQUENCE {

 prs-durationOfTwoPRS-BWA-ProcessingSymbolsN-r18

 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 prs-durationOfTwoPRS-BWA-ProcessingSymbolsT-r18

 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80, ms160, ms320, ms640, ms1280}

 } OPTIONAL,

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1-r18 SEQUENCE {

 scs15-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs30-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL

 },

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2-r18 SEQUENCE {

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs120-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL

 }

}

PRS-BWA-ThreeContiguousIntrabandInMG-r18 ::= SEQUENCE {

 maximumOfThreeAggregatedDL-PRS-Bandwidth-FR1-r18

 ENUMERATED {mhz15, mhz20, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100, mhz120,

 mhz140, mhz150, mhz180, mhz200, mhz240, mhz300} OPTIONAL,

 maximumOfThreeAggregatedDL-PRS-Bandwidth-FR2-r18

 ENUMERATED {mhz150, mhz200, mhz300, mhz400, mhz600, mhz800, mhz1000,

 mhz1200} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR1-r18

 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR2-r18

 ENUMERATED {mhz50, mhz100, mhz200, mhz400} OPTIONAL,

 dl-PRS-BufferTypeOfBWA-r18 ENUMERATED {type1, type2},

 prs-durationOfThreePRS-BWA-Processing-r18 SEQUENCE {

 prs-durationOfThreePRS-BWA-ProcessingSymbolsN-r18

 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 prs-durationOfThreePRS-BWA-ProcessingSymbolsT-r18

 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80, ms160,

 ms320, ms640, ms1280}

 } OPTIONAL,

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1-r18 SEQUENCE {

 scs15-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs30-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL

 },

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2-r18 SEQUENCE {

 scs60-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs120-r18 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL

 }

}

DL-PRS-MeasurementWithRxFH-RRC-Connected-r18 ::=SEQUENCE {

 maximumPRS-BandwidthAcrossAllHopsFR1-r18 ENUMERATED {mhz40, mhz50, mhz80, mhz100}

 OPTIONAL,

 maximumPRS-BandwidthAcrossAllHopsFR2-r18 ENUMERATED {mhz100, mhz200, mhz400} OPTIONAL,

 maximumFH-Hops-r18 ENUMERATED {n2, n3, n4, n5, n6} OPTIONAL,

 processingDuration-r18 SEQUENCE {

 processingPRS-SymbolsDurationN3-r18 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2,

 ms4, ms6, ms8, ms12,ms16, ms20, ms25,

 ms30, ms32, ms35, ms40, ms45, ms50},

 processingDurationT3-r18 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80,

 ms160, ms320, ms640, ms1280}

 } OPTIONAL,

 rf-RxRetuneTimeFR1-r18 ENUMERATED {n70,n140,n210} OPTIONAL,

 rf-RxRetuneTimeFR2-r18 ENUMERATED {n35,n70,n140} OPTIONAL,

 numOfOverlappingPRB-r18 ENUMERATED {n0,n1,n2,n4} OPTIONAL,

 ...

}

-- ASN1STOP

| *NR-DL-PRS-ProcessingCapability* field descriptions |
| --- |
| ***maxSupportedFreqLayers***Indicates the maximum number of positioning frequency layers supported by UE. |
| ***simulLTE-NR-PRS***Indicates whether the UE supports parallel processing of LTE PRS and NR DL-PRS. |
| ***dummy***This field is not used in the specification. If received it shall be ignored by the receiver. |
| ***supportedBandwidthPRS***Indicates the maximum number of DL-PRS bandwidth in MHz, which is supported and reported by UE. |
| ***dl-PRS-BufferType***IndicatesDL-PRS buffering capability. Value *type1* indicates sub-slot/symbol level buffering and value *type2* indicates slot level buffering. |
| ***durationOfPRS-Processing***Indicates the duration *N* of DL-PRS symbols in units of ms a UE can process every T ms assuming maximum DL-PRS bandwidth provided in *supportedBandwidthPRS* and comprises the following subfields:- ***durationOfPRS-ProcessingSymbols***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***durationOfPRS-ProcessingSymbolsInEveryTms***: This field specifies the values for *T*. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280 ms.See NOTE 9. |
| ***maxNumOfDL-PRS-ResProcessedPerSlot***Indicates the maximum number of DL-PRS Resources that UE can process in a slot. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands.  |
| ***supportedDL-PRS-ProcessingSamples-RRC-CONNECTED***Indicates the UE capability for support of measurements based on measuring M=1 or M=2 (instances) of a DL-PRS Resource Set. The UE can include this field only if the UE supports *prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 1: This feature is supported for both UE-assisted and UE based positioning. |
| ***prs-ProcessingWindowType1A***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 1A refers to the determination of prioritization between DL-PRS and other DL signals/channels in all OFDM symbols within the DL-PRS Processing Window. The DL signals/channels from all DL CCs (per UE) are affected across LTE and NR. Enumerated value indicates supported priority handing options of DL-PRS:- *option1*: Support of "st1" and "st3" defined in clause 5.1.6.5 of TS 38.214 [45].- *option2*: Support of "st1", "st2", and "st3" defined in clause 5.1.6.5 of TS 38.214 [45].- *option3*: Support of "st1" only defined in clause 5.1.6.5 of TS 38.214 [45].The UE can include this field only if the UE supports *prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 2: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 2a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingWindowType1B***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 1B refers to the determination of prioritization between DL-PRS and other DL signals/channels in all OFDM symbols within the DL-PRS processing window. The DL signals/channels from a certain band are affected. Enumerated value indicates supported priority handing options of DL-PRS (see *prs-ProcessingWindowType1A*).The UE can include this field only if the UE supports prs-ProcessingCapabilityBandList. Otherwise, the UE does not include this field.NOTE 3: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 3a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingWindowType2***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 2 refers to the determination of prioritization between DL-PRS and other DL signals/channels only in DL-PRS symbols within the DL-PRS processing window. Enumerated value indicates supported priority handing options of DL-PRS (see *prs-ProcessingWindowType1A*).The UE can include this field only if the UE supports *prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 4: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 4a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingCapabilityOutsideMGinPPW***Indicates the DL-PRS Processing Capability outside MG of each of the supported PPW Type in the case the UE supports multiple PPW Types in a band and comprises the following subfields:- ***prsProcessingType***: Indicates the DL-PRS Processing Window Type for which the *prs-ProcessingCapabilityOutsideMGinPPW* are provided.- ***ppw-dl-PRS-BufferType***: Indicates DL-PRS buffering capability. Value '*type1'* indicates sub-slot/symbol level buffering and value '*type2'* indicates slot level buffering.- ***ppw-durationOfPRS-Processing1***: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth* and comprises the following subfields:- ***ppw-durationOfPRS-ProcessingSymbolsN***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***ppw-durationOfPRS-ProcessingSymbolsT***: This field specifies the values for *T*. Enumerated values indicate 1, 2, 4, 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280 ms.- ***ppw-durationOfPRS-Processing2***: Indicates the duration of DL-PRS symbols N2 in units of ms a UE can process inT2 ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth* and comprises the following subfields:- ***ppw-durationOfPRS-ProcessingSymbolsN2***: This field specifies the values for *N2*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 3, 4, 5, 6, 8, 12 ms.- ***ppw-durationOfPRS-ProcessingSymbolsT2***: This field specifies the values for *T2*. Enumerated values indicate 4, 5, 6, 8 ms.- ***ppw-maxNumOfDL-PRS-ResProcessedPerSlot:*** Indicates the maximum number of DL-PRS resources that UE can process in a slot. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands.- ***ppw-maxNumOfDL-Bandwidth:*** Indicates the maximum number of DL-PRS bandwidth in MHz, which is supported and reported by UE for DL-PRS measurement outside MG within the PPW.The UE can include this field only if the UE supports one of *prs-ProcessingWindowType1A*, *prs-ProcessingWindowType1B* and *prs-ProcessingWindowType2*. Otherwise, the UE does not include this field.NOTE 5: A UE that supports one of *prs-ProcessingWindowType1A*, *prs-ProcessingWindowType1B* or *prs-ProcessingWindowType2* shall always include the *prs-ProcessingCapabilityOutsideMGinPPW*.NOTE 6: The (N, T) UE capability in *ppw-durationOfPRS-Processing1* is interpreted as in NOTE 9, and the UE is expected to receive the DL-PRS within the DL-PRS processing window but the processing of the received DL-PRS may be outside a DL-PRS processing window.NOTE 7: The (N2, T2) UE capability in *ppw-durationOfPRS-Processing2* is interpreted such that the UE is capable of measuring up to N2 ms DL-PRS within a PPW and is capable of completing the DL-PRS processing within the PPW, e.g., if the time duration from the last symbol of the measured DL-PRS Resource(s) inside the PPW to the end of PPW is not smaller than T2 ms.NOTE 8: A UE which supports *prs-ProcessingCapabilityOutsideMGinPPW* shall support either *ppw-durationOfPRS-Processing1* or *ppw-durationOfPRS-Processing2*, but not both for each supported type in a band. |
| ***dl-PRS-BufferType-RRC-Inactive***IndicatesDL-PRS buffering capability in RRC\_INACTIVE state. Value '*type1'* indicates sub-slot/symbol level buffering and value '*type2'* indicates slot level buffering. |
| ***durationOfPRS-Processing-RRC-Inactive***Indicates the duration *N* of DL-PRS symbols in units of ms a UE can process every *T* ms in RRC\_INACTIVE state assuming maximum DL-PRS bandwidth provided in *supportedBandwidthPRS* and comprises the following subfields:- ***durationOfPRS-ProcessingSymbols***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***durationOfPRS-ProcessingSymbolsInEveryTms***: This field specifies the values for *T*. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280 ms.See NOTE 9. |
| ***maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive***Indicates the maximum number of DL-PRS Resources a UE can process in a slot in RRC\_INACTIVE state. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands. |
| ***supportedLowerRxBeamSweepingFactor-FR2***Indicates support of the lower Rx beam sweeping factor than 8 for FR2. Enumerated value indicates the number of Rx beam sweeping factors supported. |
| ***supportedDL-PRS-ProcessingSamples-RRC-Inactive***Indicates the UE capability for support of reduced number of samples for DL-PRS measurement in RRC\_INACTIVE state. The UE can include this field only if the UE supports *prs-ProcessingRRC-Inactive* defined in TS 38.331 [35]. Otherwise, the UE does not include this field. |
| ***maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Inactive***Indicates the maximum number of single-symbol DL-PRS Resources that UE can process in a slot in RRC\_INACTIVE. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands. A UE which supports *maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Inactive* shall support single-symbol DL-PRS with the comb sizes from {2,4,6,12}.The UE can include this field only if the UE supports one of *dl-PRS-BufferType-RRC-Inactive*, *durationOfPRS-Processing-RRC-Inactive*, and *maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive*. Otherwise, the UE does not include this field. |
| ***maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Connected***Indicates the maximum number of single-symbol DL-PRS Resources that UE can process in a slot inside a measurement gap in RRC\_CONNECTED. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands. A UE which supports *maxNumOfOneSymbolPRS-ResProcessedPerSlot-RRC-Connected* shall support single-symbol DL-PRS with the comb sizes from {2,4,6,12}.The UE can include this field only if the UE supports *prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field. |
| ***ppw-maxNumOfOneSymbolPRS-ResProcessedPerSlot***Indicates the maximum number of single-symbol DL-PRS Resources that UE can process in a slot outside a measurement gap in RRC\_CONNECTED. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands. A UE which supports *ppw-maxNumOfOneSymbolPRS-ResProcessedPerSlot* shall support single-symbol DL-PRS with the comb sizes from {2,4,6,12}.The UE can include this field only if the UE supports *prs-ProcessingCapabilityOutsideMGinPPW*. Otherwise, the UE does not include this field. |
| ***prs-MeasurementWithoutMG***Indicates the UE capability for support of Rx timing difference between the serving cell and non-serving cell for DL-PRS measurement within a PPW. Value '*cp*' indicates one CP length, value '*symbolDot25*' indicates 0.25 symbol length, value '*symbolDot5*' indicates 0.5 symbol length and value '*slotDot5*' indicates 0.5 slot length. The UE can include this field only if the UE supports one of *prs-ProcessingWindowType1A*, *prs-ProcessingWindowType1B* and *prs-ProcessingWindowType2*. Otherwise, the UE does not include this field. |
| ***prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 2 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED state and and comprises the following subfields:- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR1, which is supported and reported by UE.- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.- ***maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL.- ***maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL.- ***dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.- ***prs-durationOfTwoPRS-BWA-Processing***: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsN***: This field specifies the values for N. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsT***: This field specifies the values for T. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 2560 ms.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.The UE can include this field only if the UE supports *supportedBandwidthPRS, dl-PRS-BufferType, durationOfPRS-Processing* and *maxNumOfDL-PRS-ResProcessedPerSlot*. Otherwise, the UE does not include this field.NOTE 10: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE 11: The value N should be equal or smaller than the value N reported by *durationOfPRS-ProcessingSymbols*, or this value T should be equal or larger than the value T reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE 12: Each two linked DL-PRS Resources are counted as 1 resource.NOTE 13: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot.*NOTE 14: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30%. |
| ***prs-BWA-ThreeContiguousIntrabandInMG-RRC-Connected***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 3 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED state and comprises the following subfields:**- *maximumOfThreeAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz of for FR1, which is supported and reported by UE.**- *maximumOfThreeAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.**- *maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL**- *maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL**- *dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.**- *prs-durationOfThreePRS-BWA-Processing***: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.**- *prs-durationOfThreePRS-BWA-ProcessingSymbolsN***: This field specifies the values for N. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.**- *prs-durationOfThreePRS-BWA-ProcessingSymbolsT***: This field specifies the values for T. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 3840 ms.**- *maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.**- *maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.The UE can include this field only if the UE supports *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected****.*** Otherwise, the UE does not include this field.NOTE15: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE16: The value N should be equal or smaller than the value N reported by *durationOfPRS-ProcessingSymbols*, or this value T should be equal or larger than the value T reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE17: Each three linked DL-PRS Resources are counted as 1 resource.NOTE18: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot*.NOTE19: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30%. |
| ***prs-BWA-TwoContiguousIntraband-RRC-IdleAndInactive***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 2 PFLs in intra-band contiguous for RRC\_INACTIVE and RRC\_IDLE state.The UE can include this field only if the UE supports *dl-PRS-BufferType-RRC-Inactive, durationOfPRS-Processing-RRC-Inactive and maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive*. Otherwise, the UE does not include this field. The capability signalling comprises the following parameters:- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR1, which is supported and reported by UE.- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.- ***maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL.- ***maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL.- ***dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.- ***prs-durationOfTwoPRS-BWA-Processing***: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsN***: This field specifies the values for N. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsT***: This field specifies the values for T. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 2560 ms.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.NOTE 20: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE 21: The value N should be equal or smaller than the value N reported by *durationOfPRS-ProcessingSymbols*, or this value T should be equal or larger than the value T reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE 22: Each two linked DL-PRS resources are counted as 1 resource.NOTE 23: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive.* |
| ***prs-BWA-ThreeContiguousIntraband-RRC-IdleAndInactive***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 3 PFLs in intra-band contiguous for RRC\_INACTIVE and RRC\_IDLE state. The UE can include this field only if the UE supports *prs-BWA-TwoContiguousIntraband-RRC-IdleAndInactive*. Otherwise, the UE does not include this field. The capability signalling comprises the following parameters:**- *maximumOfThreeAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz of for FR1, which is supported and reported by UE.**- *maximumOfThreeAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.**- *maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL**- *maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL**- *dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.**- *prs-durationOfThreePRS-BWA-Processing***: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.**- *prs-durationOfThreePRS-BWA-ProcessingSymbolsN***: This field specifies the values for N. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.**- *prs-durationOfThreePRS-BWA-ProcessingSymbolsT***: This field specifies the values for T. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 3840 ms.**- *maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.**- *maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.NOTE 24: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE 25: The value N should be equal or smaller than the value N reported by *durationOfPRS-ProcessingSymbols*, or this value T should be equal or larger than the value T reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE 26: Each two linked DL-PRS resources are counted as 1 resource.NOTE 27: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive.* |
| ***reducedNumOfSampleInMeasurementWithPRS-BWA-RRC-Connected***Indicates whether the UE supports reduced number of samples in positioning measurements with DL-PRS bandwidth aggregation for RRC\_CONNECTED. The UE can include this field only if the UE indicates the capability of maximum aggregated DL-PRS bandwidth for the supported FR1 or FR2 bands by using *maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1* or *maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2* of *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected****.*** Otherwise, the UE does not include this field. |
| ***reducedNumOfSampleInMeasurementWithPRS-BWA-RRC-IdleAndInactive***Indicates whether the UE supports reduced number of samples in positioning measurements with DL-PRS bandwidth aggregation for RRC\_IDLE and RRC\_INACTIVE. The UE can include this field only if the UE indicates the capability of maximum aggregated DL-PRS bandwidth for the supported FR1 or FR2 bands by using *maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1* or *maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2* of *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected****.*** Otherwise, the UE does not include this field. |
| ***dl-PRS-MeasurementWithRxFH-RRC-Inactive***Indicates the UE capability for support of DL-PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs. The UE can include this field only if the UE supports *dl-PRS-MeasurementWithRxFH-RRC-Connected* and *prs-ProcessingRRC-Inactive* defined in TS 38.331 [35]. Otherwise, the UE does not include this field. |
| ***dl-PRS-MeasurementWithRxFH-RRC-Idle***Indicates the UE capability for support of DL-PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs. The UE can include this field only if the UE supports *dl-PRS-MeasurementWithRxFH-RRC-Connected*. Otherwise, the UE does not include this field. |
| ***reducedNumOfSampleForMeasurementWithFH-RRC-Connected***Indicates whether the UE supports reduced number of samples for DL-PRS based positioning measurements with frequency hopping for RRC\_CONNECTED. The UE can include this field only if the UE supports *supportOfRedCap* or *supportOfERedCap* defined in TS 38.331 [35]*,* *supportedDL-PRS-ProcessingSamples-RRC-CONNECTED* and *dl-PRS-MeasurementWithRxFH-RRC-Connected*. Otherwise, the UE does not include this field. |
| ***reducedNumOfSampleForMeasurementWithFH-RRC-IdleAndInactive***Indicates whether the UE supports reduced number of samples for DL-PRS based positioning measurements with frequency hopping for RRC\_IDLE and RRC\_INACTIVE. The UE can include this field only if the UE supports *supportOfRedCap* or *supportOfERedCap* defined in TS 38.331 [35], *supportedDL-PRS-ProcessingSamples-RRC-CONNECTED* and *dl-PRS-MeasurementWithRxFH-RRC-Connected*. Otherwise, the UE does not include this field. |
| ***supportOfPRS-BWA-WithTwoPFL-Combination***Indicates whether the UE supports DL-PRS bandwidth aggregation with two PFL combinations. The UE can include this field only if the UE supports *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected*. Otherwise, the UE does not include this field. |
| ***dl-PRS-MeasurementWithRxFH-RRC-Connected***Indicates the UE capability for DL-PRS measurement with Rx frequency hopping within a MG and measurement reporting in RRC\_CONNECTED for RedCap UEs. The UE can include this field only if the UE supports *supportedBandwidthPRS*, *dl-PRS-BufferType*, *durationOfPRS-Processing*, *maxNumOfDL-PRS-ResProcessedPerSlot* and one of *supportOfRedCap* and *supportOfERedCap* defined in TS 38.331 [35]. Otherwise, the UE does not include this field. The capability signalling comprises the following parameters:- ***maximumPRS-BandwidthAcrossAllHopsFR1:*** Indicates the maximum DL-PRS bandwidth across all hops in MHz for FR1, which is supported and reported by UE.- ***maximumPRS-BandwidthAcrossAllHopsFR2***: Indicates the maximum DL-PRS bandwidth across all hops in MHz for FR2, which is supported and reported by UE.- ***maximumFH-Hops***: Indicates the maximum number of hops, which is supported and reported by UE.- ***processingDuration***: Indicates the duration of DL-PRS symbols N3 in units of ms a UE can process every T3 ms.- ***processingPRS-SymbolsDurationN3***: This field specifies the values for N3. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***processingDurationT3***: This field specifies the values for T3. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280ms.- ***rf-RxRetuneTimeFR1***: Indicates the RF Rx retune times between consecutive hops for FR1. Enumerated values indicate 70, 140, 210µs.- ***rf-RxRetuneTimeFR2***: Indicates the RF Rx retune times between consecutive hops for FR2. Enumerated values indicate 35, 70, 140µs.- ***numOfOverlappingPRB***: Indicates the overlapping PRB(s) between adjacent hops. Enumerated values indicate 0,1,2,4 PRBs.NOTE 28: The maximum DL-PRS bandwidth per hop follows *supportedBandwidthPRS*.NOTE 29: DL-PRS buffering capability follows *dl-PRS-BufferType*. |
| NOTE 9: When the target device provides the *durationOfPRS-Processing* capability (*N*, *T*) for any time window defined in TS 38.214 [45] clause 5.1.6.5, the target device should be capable of processing all DL-PRS Resources within , if- where K is defined in the TS 38.214 [45] clause 5.1.6.5, and- the number of DL-PRS Resources in each slot does not exceed the *maxNumOfDL-PRS-ResProcessedPerSlot*, and- the configured measurement gap and a maximum ratio of measurement gap length (MGL) / measurement gap repetition period (MGRP) is as specified in TS 38.133 [46]. |

#### *– NR-DL-PRS-QCL-ProcessingCapability*

The IE *NR-DL-PRS-QCL-ProcessingCapability* defines the common DL-PRS QCL Processing capability. The target device can include this IE only if the target device supports *NR-DL-PRS-ProcessingCapability* or *NR-DL-AIML-PRS-ProcessingCapability*. Otherwise, the target device does not include this IE.

In the case of capabilities for multiple NR positioning methods from amongst DL-TDOA, DL-AoD and Multi-RTT positioning methods are provided, the target device shall indicate the same values for the capabilities in IEs *NR-DL-TDOA-ProvideCapabilities*, *NR-DL-AoD-ProvideCapabilities*, and *NR-Multi-RTT-ProvideCapabilities*.

-- ASN1START

NR-DL-PRS-QCL-ProcessingCapability-r16 ::= SEQUENCE {

 dl-PRS-QCL-ProcessingCapabilityBandList-r16 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF

 DL-PRS-QCL-ProcessingCapabilityPerBand-r16,

 ...

}

DL-PRS-QCL-ProcessingCapabilityPerBand-r16 ::= SEQUENCE {

 freqBandIndicatorNR-r16 FreqBandIndicatorNR-r16,

 ssb-FromNeighCellAsQCL-r16 ENUMERATED { supported} OPTIONAL,

 prs-FromServNeighCellAsQCL-r16 ENUMERATED { supported} OPTIONAL,

 ...

}

-- ASN1STOP

| *NR-DL-PRS-QCL-ProcessingCapability* field descriptions |
| --- |
| ***ssb-FromNeighCellAsQCL***Indicates the support of SSB from neighbour cell as QCL source of a DL-PRS. UE supporting this feature also support reusing SSB measurement from RRM for receiving DL-PRS.Note: It refers to Type-C for FR1 and Type-C & Type-D support for FR2. |
| ***prs-FromServNeighCellAsQCL***Indicates the support of DL-PRS from serving/neighbour cell as QCL source of a DL-PRS.Note 1: It refers to Type-D support for FR2.Note 2: A DL-PRS from a PRS-only TP is treated as DL-PRS from a non-serving cell. |

[…]

#### *– NR-DL-PRS-ResourcesCapability*

The IE *NR-DL-PRS-ResourcesCapability* defines the DL-PRS Resources capability for each NR positioning method. The target device can include this IE only if the target device supports *NR-DL-PRS-ProcessingCapability* or NR*-DL-AIML-PRS-ProcessingCapability*. Otherwise, the target device does not include this IE.

-- ASN1START

NR-DL-PRS-ResourcesCapability-r16 ::= SEQUENCE {

 maxNrOfDL-PRS-ResourceSetPerTrpPerFrequencyLayer-r16

 INTEGER (1..2),

 maxNrOfTRP-AcrossFreqs-r16 ENUMERATED { n4, n6, n12, n16, n32,

 n64, n128, n256, ..., n24-v1690},

 maxNrOfPosLayer-r16 INTEGER (1..4),

 dl-PRS-ResourcesCapabilityBandList-r16 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF

 DL-PRS-ResourcesCapabilityPerBand-r16,

 dl-PRS-ResourcesBandCombinationList-r16 DL-PRS-ResourcesBandCombinationList-r16,

 ...

}

DL-PRS-ResourcesCapabilityPerBand-r16 ::= SEQUENCE {

 freqBandIndicatorNR-r16 FreqBandIndicatorNR-r16,

 maxNrOfDL-PRS-ResourcesPerResourceSet-r16 ENUMERATED { n1, n2, n4, n8, n16, n32, n64, ...},

 maxNrOfDL-PRS-ResourcesPerPositioningFrequencylayer-r16

 ENUMERATED { n6, n24, n32, n64, n96, n128,

 n256, n512, n1024, ...},

 ...

}

DL-PRS-ResourcesBandCombinationList-r16 ::= SEQUENCE (SIZE (1..maxBandComb-r16)) OF

 DL-PRS-ResourcesBandCombination-r16

DL-PRS-ResourcesBandCombination-r16 ::= SEQUENCE {

 bandList-r16 SEQUENCE (SIZE (1..maxSimultaneousBands-r16)) OF

 FreqBandIndicatorNR-r16,

 maxNrOfDL-PRS-ResourcesAcrossAllFL-TRP-ResourceSet-r16

 CHOICE {

 fr1-Only-r16 ENUMERATED {n6, n24, n64, n128, n192,

 n256, n512, n1024, n2048},

 fr2-Only-r16 ENUMERATED {n24, n64, n96, n128, n192,

 n256, n512, n1024, n2048},

 fr1-FR2Mix-r16 SEQUENCE {

 fr1-r16 ENUMERATED {n6, n24, n64, n96, n128,

 n192, n256, n512, n1024, n2048},

 fr2-r16 ENUMERATED {n24, n64, n96, n128, n192,

 n256, n512, n1024, n2048},

 ...

 },

 ...

 },

 ...

}

-- ASN1STOP

| *NR-DL-PRS-ResourcesCapability* field descriptions |
| --- |
| ***maxNrOfDL-PRS-ResourceSetPerTrpPerFrequencyLayer***Indicates the maximum number of DL-PRS Resource Sets per TRP per positioning frequency layer supported by UE.  |
| ***maxNrOfTRP-AcrossFreqs***Indicates the maximum number of TRPs across all positioning frequency layers. |
| ***maxNrOfPosLayer***Indicates the maximum number of supported positioning frequency layers. |
| ***dl-PRS-ResourcesBandCombinationList***Provides the capabilities of DL-PRS Resources for the indicated band combination in *bandList*. This field is provided for all band combinations for which the target device supports DL-PRS. |
| ***maxNrOfDL-PRS-ResourcesPerResourceSet***Indicates the maximum number of DL-PRS Resources per DL-PRS Resource Set. Value 16, 32, 64 are only applicable to FR2 bands. Value 1 is not applicable for DL-AoD.  |
| ***maxNrOfDL-PRS-ResourcesPerPositioningFrequencylayer***Indicates the maximum number of DL-PRS Resources per positioning frequency layer. Value 6 is only applicable to FR1 bands.  |
| ***maxNrOfDL-PRS-ResourcesAcrossAllFL-TRP-ResourceSet***Indicates the maximum number of DL-PRS Resources supported by UE across all frequency layers, TRPs and DL-PRS Resource Sets.fr1-Only: This is applicable for FR1 only band combinations;fr2-Only: This is applicable for FR2 only band combinations;fr1-FR2Mix: This is applicable for band combinations containing FR1 and FR2 bands. fr1 means for FR1 in FR1/FR2 mixed operation, and fr2 means for FR2 in FR1/FR2 mixed operation.  |

[…]

#### – *NR-On-Demand-DL-PRS-Request*

The IE *NR-On-Demand-DL-PRS-Request* is used by the target device to request on-demand DL-PRS from a location server.

-- ASN1START

NR-On-Demand-DL-PRS-Request-r17 ::= SEQUENCE {

 dl-prs-StartTime-and-Duration-r17 DL-PRS-StartTime-and-Duration-r17 OPTIONAL,

 nr-on-demand-DL-PRS-Information-r17 NR-On-Demand-DL-PRS-Information-r17 OPTIONAL,

 dl-prs-configuration-id-PrefList-r17 SEQUENCE (SIZE (1..maxOD-DL-PRS-Configs-r17)) OF
 DL-PRS-Configuration-ID-r17 OPTIONAL,

 ...,

 [[

 dl-PRS-AggregationID-PrefList-r18 SEQUENCE (SIZE (1.. maxOD-DL-PRS-Configs-r17)) OF

 INTEGER (1.. maxOD-DL-PRS-Configs-r17)

 OPTIONAL,

 nr-OnDemandDL-PRS-AggregationReqList-r18 SEQUENCE (SIZE (1.. maxOD-DL-PRS-Configs-r17)) OF

 NR-OnDemandDL-PRS-AggregationReqElement-r18

 OPTIONAL

 ]],

 [[

 nr-TRP-RequestList-r19 NR-TRP-RequestList-r19 OPTIONAL

 ]]

}

DL-PRS-StartTime-and-Duration-r17 ::= SEQUENCE {

 dl-prs-start-time-r17 INTEGER (1..1024) OPTIONAL,

 dl-prs-duration-r17 SEQUENCE {

 seconds-r17 INTEGER (0..59) OPTIONAL,

 minutes-r17 INTEGER (0..59) OPTIONAL,

 hours-r17 INTEGER (0..23) OPTIONAL,

 ...

 } OPTIONAL,

 ...

}

NR-OnDemandDL-PRS-AggregationReqElement-r18 ::= SEQUENCE (SIZE (2..3)) OF

 INTEGER (1..nrMaxFreqLayers-r16)

NR-TRP-RequestList-r19 ::= SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF

 NR-TRP-RequestListPerFreqLayer-r19

NR-TRP-RequestListPerFreqLayer-r19 ::= SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF

 TRP-RequestInfoElement-r19

TRP-RequestInfoElement-r19 ::= SEQUENCE {

 dl-PRS-ID-r19 INTEGER (0..255) OPTIONAL,

 nr-PhysCellID-r19 NR-PhysCellID-r16 OPTIONAL,

 nr-CellGlobalID-r19 NCGI-r15 OPTIONAL,

 nr-ARFCN-r19 ARFCN-ValueNR-r15 OPTIONAL,

 ...

}

-- ASN1STOP

|  |
| --- |
| *NR-On-Demand-DL-PRS-Request* field descriptions |
| ***dl-prs-StartTime-and-Duration***This field specifies the requested start time and duration for the on-demand DL-PRS and comprises the following subfields:- ***dl-prs-start-time*** specifies the desired start time for the requested DL-PRS. It indicates the time in seconds from the time the IE *NR-On-Demand-DL-PRS-Request* was received.- ***dl-prs-duration*** specifies the desired duration of the requested DL-PRS. The desired duration is the sum of the *seconds*, *minutes*, *hours* fields. If this field is included, at least one of the *seconds*, *minutes*, *hours* fields shall be present. |
| ***nr-on-demand-DL-PRS-Information***This field specifies the on-demand DL-PRS configuration information requested by the target device.NOTE: If the network provided predefined on-demand DL-PRS configurations (*NR-On-Demand-DL-PRS-Configurations*), the target device can only request explicit parameters (*nr-on-demand-DL-PRS-Information*) within the scope of those configurations. |
| ***dl-prs-configuration-id-PrefList***This field specifies the on-demand DL-PRS configuration associated with *DL-PRS-Configuration-ID* in IE *NR-On-Demand-DL-PRS-Configurations* the target device wishes to obtain in the order of preference. The first *DL-PRS-Configuration-ID* in the list is the most preferred configuration, the second *DL-PRS-Configuration-ID* the second most preferred, etc. |
| ***dl-PRS-AggregationID-PrefList***This field specifies a list of identities i.e., *DL-PRS-Configuration-ID*, for On-demand DL-PRS Configuration information i.e., *On-Demand-DL-PRS-Configuration*, thatthe target device wishes to obtain, for DL-PRS aggregation, in the order of preference. The first integer value in the list is the most preferred On-demand DL-PRS Configuration information; the second integer value in the list is the second most preferred, etc. |
| ***nr-OnDemandDL-PRS-AggregationReqList***This field specifies a list of DL-PRS for specific PFL combinations for which the DL-PRS information i.e., *NR-On-Demand-DL-PRS-Information*, is requested by the target device for DL-PRS aggregation, listed in the order of preference. The first *NR-OnDemandDL-PRS-AggregationReqElement* in the list is the most preferred PFL combination for DL-PRS aggregation; the second element in the list is the second most preferred, etc. |
| ***nr-TRP-RequestList***This field specifies a list of TRPs for which the on-demand DL-PRS configuration information is requested and comprises the following subfields:- ***dl-PRS-ID*** specifies the DL-PRS ID of the TRP for which the on-demand DL-PRS is requested.- ***nr-PhysCellID*** specifies the physical Cell-ID of the TRP for which the on-demand DL-PRS is requested.- ***nr-CellGlobalID*** specifies the NCGI, the globally unique identity of a cell in NR, of the TRP for which the on-demand DL-PRS is requested, as defined in TS 38.331 [35].- ***nr-ARFCN*** specifies the NR-ARFCN of the TRP's CD-SSB (as defined in TS 38.300 [47]) corresponding to *nr-PhysCellID*.NOTE: This field is only applicable to NR DL AI/ML positioning. |

[…]

#### *– NR-PositionCalculationAssistance*

The IE *NR-PositionCalculationAssistance* is used by the location server to provide assistance data including integrity information to enable UE‑based downlink positioning.

-- ASN1START

NR-PositionCalculationAssistance-r16 ::= SEQUENCE {

 nr-TRP-LocationInfo-r16 NR-TRP-LocationInfo-r16 OPTIONAL, -- Need ON

 nr-DL-PRS-BeamInfo-r16 NR-DL-PRS-BeamInfo-r16 OPTIONAL, -- Need ON

 nr-RTD-Info-r16 NR-RTD-Info-r16 OPTIONAL, -- Need ON

 ...,

 [[

 nr-TRP-BeamAntennaInfo-r17 NR-TRP-BeamAntennaInfo-r17 OPTIONAL, -- Need ON

 nr-DL-PRS-Expected-LOS-NLOS-Assistance-r17

 NR-DL-PRS-ExpectedLOS-NLOS-Assistance-r17

 OPTIONAL, -- Need ON

 nr-DL-PRS-TRP-TEG-Info-r17 NR-DL-PRS-TRP-TEG-Info-r17 OPTIONAL -- Need ON

 ]],

 [[

 nr-IntegrityServiceParameters-r18 NR-IntegrityServiceParameters-r18 OPTIONAL, -- Need OR

 nr-IntegrityServiceAlert-r18 NR-IntegrityServiceAlert-r18 OPTIONAL, -- Need OR

 nr-IntegrityRiskParameters-r18 NR-IntegrityRiskParameters-r18 OPTIONAL, -- Need OR

 nr-IntegrityParametersTRP-LocationInfo-r18 NR-IntegrityParametersTRP-LocationInfo-r18

 OPTIONAL, -- Cond Integrity1

 nr-IntegrityParametersDL-PRS-BeamInfo-r18

 NR-IntegrityParametersDL-PRS-BeamInfo-r18

 OPTIONAL, -- Cond Integrity2

 nr-IntegrityParametersRTD-Info-r18 NR-IntegrityParametersRTD-Info-r18

 OPTIONAL, -- Cond Integrity3

 nr-IntegrityParametersTRP-BeamAntennaInfo-r18 NR-IntegrityParametersTRP-BeamAntennaInfo-r18

 OPTIONAL, -- Cond Integrity4

 nr-PRU-DL-Info-r18 NR-PRU-DL-Info-r18 OPTIONAL -- Need ON

 ]],

 [[

 nr-TRP-LocationInfo-Implicit-r19 NR-TRP-LocationInfo-Implicit-r19 OPTIONAL -- Need ON

 ]]

}

NR-IntegrityParametersTRP-LocationInfo-r18 ::= SEQUENCE {

 trp-ErrorCorrelationTime-r18 INTEGER(0..255) OPTIONAL, -- Need ON

 dl-PRS-ResourceSetARP-ErrorCorrelationTime-r18 INTEGER(0..255) OPTIONAL, -- Need ON

 dl-PRS-ResourceARP-ErrorCorrelationTime-r18 INTEGER(0..255) OPTIONAL, -- Need ON

 ...

}

NR-IntegrityParametersDL-PRS-BeamInfo-r18 ::= SEQUENCE {

 dl-PRS-BeamInfoErrorCorrelationTime-r18 INTEGER (0..255),

 ...

}

NR-IntegrityParametersRTD-Info-r18 ::= SEQUENCE {

 rtd-ErrorCorrelationTime-r18 INTEGER (0..255),

 ...

}

NR-IntegrityParametersTRP-BeamAntennaInfo-r18 ::= SEQUENCE {

 trp-BeamAntennaInfoErrorCorrelationTime-r18 INTEGER (0..255),

 ...

}

-- ASN1STOP

| Conditional presence | Explanation |
| --- | --- |
| *Integrity1* | The field is optionally present, need OR, if *nr-TRP-LocationInfo* is present and *nr-IntegrityTRP-LocationBounds* is present in IE *NR-TRP-LocationInfo;* otherwise it is not present. |
| *Integrity2* | The field is optionally present, need OR, if *nr-DL-PRS-BeamInfo* is present and *nr-IntegrityBeamInfoBounds* is present in IE *NR-DL-PRS-BeamInfo;* otherwise it is not present. |
| *Integrity3* | The field is optionally present, need OR, if *nr-RTD-Info* is present and *nr-IntegrityRTD-InfoBounds* is present in IE *NR-RTD-Info;* otherwise it is not present. |
| *Integrity4* | The field is optionally present, need OR, if *nr-TRP-BeamAntennaInfo* is present and *nr-IntegrityBeamPowerBounds* is present in IE *NR-TRP-BeamAntennaInfo;* otherwise it is not present. |

|  |
| --- |
| *NR-PositionCalculationAssistance* field descriptions |
| ***nr-TRP-LocationInfo***This field provides the location coordinates of the TRPs and location coordinates of antenna reference points for DL-PRS Resource Set(s) and DL-PRS Resources of the TRPs. |
| ***nr-DL-PRS-BeamInfo***This field provides the spatial directions of DL-PRS Resources for TRPs. |
| ***nr-RTD-Info***This field provides the time synchronization information between the reference TRP and neighbour TRPs.  |
| ***nr-TRP-BeamAntennaInfo***This field provides the relative DL-PRS Resource power between DL-PRS Resources per angle per TRP. |
| ***nr-DL-PRS-ExpectedLOS-NLOS-Assistance***This field provides the expected likelihood of a LOS propagation path from a TRP to the target device. The information is provided per TRP or per DL-PRS Resource. |
| ***nr-DL-PRS-TRP-TEG-Info***This field provides the TRP Tx TEG ID associated with the transmission of each DL-PRS Resource of the TRP. |
| ***nr-IntegrityServiceParameters***This field specifiesthe range of Integrity Risk (IR) for which the integrity assistance data are valid. |
| ***nr-IntegrityServiceAlert***This field indicates whether the corresponding assistance data can be used for integrity related applications. |
| ***trp-ErrorCorrelationTime***This field specifies the TRP Error Correlation Time which is the upper bound of the correlation time of the TRP error. The time is calculated using:Range is 1-28,200 s. |
| ***dl-PRS-ResourceSetARP-ErrorCorrelationTime***This field, if present, specifies the DL-PRS Resource Set ARP Error Correlation Time which is the upper bound of the correlation time of the DL-PRS Resource Set ARP error. The time is calculated using:Range is 1-28,200 s. |
| ***dl-PRS-ResourceARP-ErrorCorrelationTime***This field, if present, specifies the DL-PRS Resource ARP Error Correlation Time which is the upper bound of the correlation time of the DL-PRS Resource ARP error. The time is calculated using:Range is 1-28,200 s. |
| ***rtd-ErrorCorrelationTime***This field specifies the inter-TRP synchronization error Correlation Time which is the upper bound of the correlation time of the inter-TRP synchronization error. The correlation time is calculated using:Where *i* is the value given by *rtdErrorCorrelationTime*. Range is 1-28,200 s. |
| ***dl-PRS-BeamInfoErrorCorrelationTime***This field specifies the Beam Boresight Direction Angle Error Correlation Time which is the upper bound of the correlation time of the DL-PRS Resource angle error. The time is calculated using:Range is 1-28,200 s. |
| ***trp-BeamAntennaInfoErrorCorrelationTime***This field specifies the Mean Beam Power Error Correlation Time which is the upper bound of the correlation time of the mean beam power error.The time is calculated using:Range is 1-28,200 s. |
| ***nr-PRU-DL-Info***This field provides the measurements reported by a PRU to the target UE. |
| ***nr-TRP-LocationInfo-Implicit***This field provides implicit information on location coordinates of the TRPs.NOTE: This field is only applicable to NR DL AI/ML positioning. |

[…]

#### 6.5.13.6 NR DL AI/ML Positioning Capability Information

#### – *NR-DL-AIML-ProvideCapabilities*

The IE *NR-DL-AIML-ProvideCapabilities* is used by the target device to indicate its capability to support NR DL AI/ML positioning and to provide its NR DL AI/ML positioning capabilities to the location server.

-- ASN1START

NR-DL-AIML-ProvideCapabilities-r19 ::= SEQUENCE {

 locationCoordinateTypes-r19 LocationCoordinateTypes OPTIONAL,

 periodicalReporting-r19 ENUMERATED { supported } OPTIONAL,

 periodicReportingIntervalMsSupport-r19 PeriodicReportingIntervalMsSupport-r18 OPTIONAL,

 ten-ms-unit-ResponseTime-r19 ENUMERATED { supported } OPTIONAL,

 scheduledLocationRequestSupported-r19 ScheduledLocationTimeSupport-r17 OPTIONAL,

 nr-PosCalcAssistanceSupport-r19 BIT STRING {

 trpLocSup (0),

 beamInfoSup (1),

 rtdInfoSup (2),

 trpTEG-InfoSup (3),

 nr-IntegritySup (4),

 pruInfoSup (5),

 trpLoc-ImplicitSup (6)

 } (SIZE (1..8)) OPTIONAL,

 nr-los-nlos-AssistanceDataSupport-r19 SEQUENCE {

 type LOS-NLOS-IndicatorType2-r17,

 granularity LOS-NLOS-IndicatorGranularity2-r17,

 ...

 } OPTIONAL,

 nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r19 BIT STRING {

 eAoD (0),

 eAoA (1)

 } (SIZE (1..8)) OPTIONAL,

 nr-DL-AIML-On-Demand-DL-PRS-Support-r19 NR-On-Demand-DL-PRS-Support-r17 OPTIONAL,

 nr-DL-AIML-On-Demand-DL-PRS-ForBWA-Support-r19

 ENUMERATED { supported } OPTIONAL,

 nr-dl-prs-AssistanceDataValidity-r19 SEQUENCE {

 area-validity INTEGER (1..maxNrOfAreas-r17) OPTIONAL,

 ...

 } OPTIONAL,

 multiLocationEstimateInSameMeasReport-r19 ENUMERATED { supported } OPTIONAL,

 nr-IntegrityAssistanceSupport-r19 BIT STRING {

 serviceParametersSup (0),

 serviceAlertSup (1),

 riskParametersSup (2),

 integrityParaTRP-LocSup (3),

 integrityParaBeamInfoSup (4),

 integrityParaRTD-InfoSup (5)

 } (SIZE (1..8)) OPTIONAL,

 nr-DL-AIML-CapabilityPerBandList-r19 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF

 NR-DL-AIML-CapabilityPerBand-r19 OPTIONAL, nr-DL-AIML-PRS-Capability-r19 NR-DL-PRS-ResourcesCapability-r16,

 nr-DL-AIML-QCL-ProcessingCapability-r19 NR-DL-PRS-QCL-ProcessingCapability-r16,

 nr-DL-AIML-PRS-ProcessingCapability-r19 NR-DL-AIML-PRS-ProcessingCapability-r19,

 ...

}

NR-DL-AIML-CapabilityPerBand-r19 ::= SEQUENCE {

 freqBandIndicatorNR-r19 FreqBandIndicatorNR-r16,

 simul-DL-AIML-and-DL-TDOA-r19 ENUMERATED { supported} OPTIONAL,

 simul-DL-AIML-and-DL-AoD-r19 ENUMERATED { supported} OPTIONAL,

 supportOfDL-PRS-BWA-RRC-Connected-r19 ENUMERATED { supported } OPTIONAL,

 ...

}

-- ASN1STOP

|  |
| --- |
| *NR-DL-AIML-ProvideCapabilities* field descriptions |
| ***locationCoordinateTypes***This field indicates the geographical location coordinate types that a target device supports for DL AI/ML positioning. TRUE indicates that a location coordinate type is supported and FALSE that it is not. |
| ***periodicalReporting***This field, if present, indicates that the target device supports *periodicalReporting.* If this field is absent, the target device does not support *periodicalReporting* in *CommonIEsRequestLocationInformation* from the location server. |
| ***periodicReportingIntervalMsSupport***This field, if present, indicates that the target device supports the *reportingIntervalMs* in IE *PeriodicalReportingCriteriaExt* in IE *CommonIEsRequestLocationInformation* from the location server and specifies the minimum millisecond periodic reporting interval supported. |
| ***ten-ms-unit-ResponseTime***This field, if present, indicates that the target device supports the enumerated value '*ten-milli-seconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. |
| ***scheduledLocationRequestSupported***This field, if present, indicates that the target device supports scheduled location requests – i.e., supports the IE *ScheduledLocationTime* in IE *CommonIEsRequestLocationInformation* – and the time base(s) supported for the scheduled location time. |
| ***nr-PosCalcAssistanceSupport***This field indicates the Position Calculation Assistance Data supported by the target device. This is represented by a bit string, with a one‑value at the bit position means the particular assistance data is supported; a zero‑value means not supported.- bit 0 indicates whether the field *nr-TRP-LocationInfo* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 1 indicates whether the field *nr-DL-PRS-BeamInfo* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 2 indicates whether the field *nr-RTD-Info* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 3 indicates whether the field *nr-DL-PRS-TRP-TEG-Info* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 4 together with bit 0 indicates whether the fields *nr-IntegrityTRP-LocationBounds*, *nr-IntegrityDL-PRS-ResourceSetARP-LocationBounds*, *nr-IntegrityDL-PRS-ResourceARP-LocationBounds* in IE *NR-TRP-LocationInfo* are supported or not; bit 4 together with bit 1 indicates whether the field *nr-IntegrityBeamInfoBounds* in IE *NR-DL-PRS-BeamInfo* is supported or not; bit 4 together with the bit 2 indicates whether the field *nr-IntegrityRTD-InfoBounds* in IE *NR-RTD-Info* is supported or not;- bit 5 indicates whether the field *nr-PRU-DL-Info* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 6 indicates whether the field *nr-TRP-LocationInfo-Implicit* in IE *NR-PositionCalculationAssistance* is supported or not. |
| ***nr-los-nlos-AssistanceDataSupport***This field, if present, indicates that the target device supports the *NR-DL-PRS-ExpectedLOS-NLOS-Assistance* in IE *NR-PositionCalculationAssistance*:- *type* indicates whether the target device supports '*hard*' value or '*hard*' and '*soft*' value in *LOS-NLOS-Indicator* in IE *NR-DL-PRS-ExpectedLOS-NLOS-Assistance*.- *granularity* indicates whether the target device supports the granularity for *nr-los-nlos-indicator* in IE *NR-DL-PRS-ExpectedLOS-NLOS-Assistance* of '*per-trp*', '*per-resource*', or both. |
| ***nr-DL-PRS-ExpectedAoD-or-AoA-Sup***This field, if present, indicates that the target device supports the *NR-DL-PRS-ExpectedAoD-or-AoA* in *NR-DL-PRS-AssistanceData.* |
| ***nr-DL-AIML-On-Demand-DL-PRS-Support***This field, if present, indicates that the target device supports on-demand DL-PRS requests. |
| ***nr-DL-AIML-On-Demand-DL-PRS-ForBWA-Support***This field, if present, indicates that the target device supports on-demand DL-PRS request for bandwidth aggregation. |
| ***nr-dl-prs-AssistanceDataValidity***This field, if present, indicates that the target device supports validity conditions for pre-configured assistance data and comprises the following subfields:- ***area-validity*** indicates that the target device supports pre-configured assistance data with area validity. The integer number indicates the maximum number of areas the target device supports*.* |
| ***multiLocationEstimateInSameMeasReport***This field, if present, indicates that the target device supports multiple location estimate instances in a single measurement report. |
| ***nr-IntegrityAssistanceSupport***This field indicates the Integrity Assistance Data supported. This is represented by a bit string, with a one‑value at the bit position means the particular assistance data is supported; a zero‑value means not supported.- bit 0 indicates whether the field *nr-IntegrityServiceParameters* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 1 indicates whether the field *nr-IntegrityServiceAlert* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 2 indicates whether the field *nr-IntegrityRiskParameters* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 3 indicates whether the field *nr-IntegrityParametersTRP-LocationInfo* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 4 indicates whether the field *nr-IntegrityParametersDL-PRS-BeamInfo* in IE *NR-PositionCalculationAssistance* is supported or not;- bit 5 indicates whether the field *nr-IntegrityParametersRTD-Info* in IE *NR-PositionCalculationAssistance* is supported or not. |
| ***simul-DL-AIML-and-DL-TDOA***This field, if present, indicates that the target device supports simultaneous operation of NR DL AI/ML and NR DL-TDOA positioning. The target device can include this field only if the target device supports UE-based NR DL-TDOA. Otherwise, the target device does not include this field. |
| ***simul-DL-AIML-and-DL-AoD***This field, if present, indicates that the target device supports simultaneous operation of NR DL AI/ML and NR DL-AoD positioning. The target device can include this field only if the target device supports UE-based NR DL-AoD. Otherwise, the target device does not include this field. |
| ***supportOfDL-PRS-BWA-RRC-Connected***Indicates whether the target device supports DL-PRS bandwidth aggregation in RRC\_CONNECTED for NR DL AI/ML positioning.The target device can include this field only if the target device supports *maxNrOfDL-PRS-ResourceSetPerTrpPerFrequencyLayer, maxNrOfTRP-AcrossFreqs, maxNrOfPosLayer* and *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected*. Otherwise, the target device does not include this field. |
| ***nr-DL-AIML-PRS-Capability***This field indicates the DL-PRS Resources capability supported by the target device. |
| ***nr-DL-AIML-QCL-ProcessingCapability***This field indicates DL-PRS QCL Processing capability supported by the target device. |
| ***nr-DL-AIML-PRS-ProcessingCapability***This field indicates the DL-PRS Processing capability supported by the target device. |

#### 6.5.13.6a NR DL AI/ML Positioning Capability Information Elements

#### *– NR-DL-AIML-PRS-ProcessingCapability*

The IE *NR-DL-AIML-PRS-ProcessingCapability* defines the DL-PRS Processing capability for NR DL AI/ML Positioning. Some fields in this IE (as identified in the field descriptions), if not included in this IE, but the corresponding fields are included in the IE *NR-DL-PRS-ProcessingCapability*, those capabilities are applicable to NR DL AI/ML positioning also.

-- ASN1START

NR-DL-AIML-PRS-ProcessingCapability-r19 ::= SEQUENCE {

 nr-dl-aiml-prs-ProcessingCapabilityBandList-r19 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF

 NR-DL-AIML-PRS-ProcessingCapabilityPerBand-r19,

 multipleActivatedPRS-ProcessingWindows-r19 ENUMERATED {n2, n3, n4} OPTIONAL,

 ...

}

NR-DL-AIML-PRS-ProcessingCapabilityPerBand-r19 ::= SEQUENCE {

 freqBandIndicatorNR-r19 FreqBandIndicatorNR-r16,

 nr-dl-aiml-prs-ProcessingCapability-r19 NR-DL-AIML-PRS-ProcessingCapabilityElement-r19

 OPTIONAL,

 prs-ProcessingWindowType1A-r19 ENUMERATED { option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType1B-r19 ENUMERATED { option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType2-r19 ENUMERATED { option1, option2, option3} OPTIONAL,

 prs-ProcessingCapabilityOutsideMGinPPW-r19

 SEQUENCE (SIZE(1..3)) OF

 PRS-ProcessingCapabilityOutsideMGinPPWperType-r19

 OPTIONAL,

 prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected-r19

 PRS-BWA-TwoContiguousIntrabandInMG-r19 OPTIONAL,

 prs-BWA-ThreeContiguousIntrabandInMG-RRC-Connected-r19

 PRS-BWA-ThreeContiguousIntrabandInMG-r19 OPTIONAL,

 supportOfPRS-BWA-WithTwoPFL-Combination-r19

 ENUMERATED { supported } OPTIONAL,

 ...

}

NR-DL-AIML-PRS-ProcessingCapabilityElement-r19 ::= SEQUENCE {

 supportedBandwidthPRS-r19 CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz20, mhz40,

 mhz50, mhz80, mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400},

 ...

 },

 dl-PRS-BufferType-r19 ENUMERATED {type1, type2, ...},

 durationOfPRS-Processing-r19 SEQUENCE {

 durationOfPRS-ProcessingSymbols-r19 ENUMERATED {nDot125, nDot25, nDot5, n1,

 n2, n4, n6, n8, n12, n16, n20, n25,

 n30, n32, n35, n40, n45, n50},

 durationOfPRS-ProcessingSymbolsInEveryTms-r19

 ENUMERATED {n8, n16, n20, n30, n40, n80,

 n160, n320, n640, n1280},

 ...

 },

 maxNumOfDL-PRS-ResProcessedPerSlot-r19

 SEQUENCE {

 scs15-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs30-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 scs120-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64} OPTIONAL,

 ...

 },

 ...

}

PRS-ProcessingCapabilityOutsideMGinPPWperType-r19 ::= SEQUENCE {

 prsProcessingType-r19 ENUMERATED { type1A, type1B, type2 },

 ppw-dl-PRS-BufferType-r19 ENUMERATED { type1, type2, ... },

 ppw-durationOfPRS-Processing1-r19

 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN-r19

 ENUMERATED { msDot125, msDot25, msDot5, ms1, ms2, ms4,

 ms6, ms8, ms12, ms16, ms20, ms25, ms30, ms32,

 ms35, ms40, ms45, ms50 },

 ppw-durationOfPRS-ProcessingSymbolsT-r19

 ENUMERATED { ms1, ms2, ms4, ms8, ms16, ms20, ms30, ms40,

 ms80, ms160, ms320, ms640, ms1280 },

 ...

 } OPTIONAL,

 ppw-durationOfPRS-Processing2-r19

 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN2-r19

 ENUMERATED { msDot125, msDot25, msDot5, ms1, ms2, ms3, ms4,

 ms5, ms6, ms8, ms12 },

 ppw-durationOfPRS-ProcessingSymbolsT2-r19

 ENUMERATED { ms4, ms5, ms6, ms8 },

 ...

 } OPTIONAL,

 ppw-maxNumOfDL-PRS-ResProcessedPerSlot-r19

 SEQUENCE {

 scs15-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64 } OPTIONAL,

 scs30-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64 } OPTIONAL,

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64 } OPTIONAL,

 scs120-r19 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24,

 n32, n48, n64 } OPTIONAL,

 ...

 },

 ppw-maxNumOfDL-Bandwidth-r19 CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80,mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400},

 ...

 } OPTIONAL,

 ...

}

PRS-BWA-TwoContiguousIntrabandInMG-r19 ::= SEQUENCE {

 maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1-r19 ENUMERATED {mhz10, mhz20, mhz40, mhz50,

 mhz80, mhz100, mhz160, mhz200}

 OPTIONAL,

 maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2-r19 ENUMERATED {mhz100, mhz200, mhz400, mhz800}

 OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR1-r19 ENUMERATED {mhz5, mhz10, mhz20, mhz40,

 mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR2-r19 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 OPTIONAL,

 dl-PRS-BufferTypeOfBWA-r19 ENUMERATED {type1, type2},

 prs-durationOfTwoPRS-BWA-Processing-r19 SEQUENCE {

 prs-durationOfTwoPRS-BWA-ProcessingSymbolsN-r19

 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 prs-durationOfTwoPRS-BWA-ProcessingSymbolsT-r19

 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80, ms160, ms320, ms640, ms1280},

 ...

 } OPTIONAL,

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1-r19 SEQUENCE {

 scs15-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs30-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 ...

 },

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2-r19 SEQUENCE {

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs120-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 ...

 },

 ...

}

PRS-BWA-ThreeContiguousIntrabandInMG-r19 ::= SEQUENCE {

 maximumOfThreeAggregatedDL-PRS-Bandwidth-FR1-r19

 ENUMERATED {mhz15, mhz20, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100, mhz120,

 mhz140, mhz150, mhz180, mhz200, mhz240, mhz300} OPTIONAL,

 maximumOfThreeAggregatedDL-PRS-Bandwidth-FR2-r19

 ENUMERATED {mhz150, mhz200, mhz300, mhz400, mhz600, mhz800, mhz1000,

 mhz1200} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR1-r19

 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfDL-PRS-BandwidthPerPFL-FR2-r19

 ENUMERATED {mhz50, mhz100, mhz200, mhz400} OPTIONAL,

 dl-PRS-BufferTypeOfBWA-r19

 ENUMERATED {type1, type2},

 prs-durationOfThreePRS-BWA-Processing-r19 SEQUENCE {

 prs-durationOfThreePRS-BWA-ProcessingSymbolsN-r19

 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 prs-durationOfThreePRS-BWA-ProcessingSymbolsT-r19

 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80, ms160,

 ms320, ms640, ms1280},

 ...

 } OPTIONAL,

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1-r19 SEQUENCE {

 scs15-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs30-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 ...

 },

 maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2-r19 SEQUENCE {

 scs60-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 scs120-r19 ENUMERATED {n1, n2, n4, n6, n8, n12,

 n16, n24, n32, n48, n64 } OPTIONAL,

 ...

 },

 ...

}

-- ASN1STOP

| *NR-DL-AIML-PRS-ProcessingCapability* field descriptions |
| --- |
| ***multipleActivatedPRS-ProcessingWindows***Indicates support for more than one activated PRS processing windows and the number of activated PRS processing windows supported. |
| ***nr-dl-aiml-prs-ProcessingCapability***Indicates the DL-PRS processing capability for NR DL AI/ML positioning and comprises the following subfields:- ***supportedBandwidthPRS***: Indicates the maximum number of DL-PRS bandwidth in MHz, which is supported and reported by UE.- ***dl-PRS-BufferType***: Indicates DL-PRS buffering capability. Value type1 indicates sub-slot/symbol level buffering and value type2 indicates slot level buffering.- ***durationOfPRS-Processing***: Indicates the duration *N* of DL-PRS symbols in units of ms a UE can process every *T* ms assuming maximum DL-PRS bandwidth provided in *supportedBandwidthPRS* and comprises the following subfields:- ***durationOfPRS-ProcessingSymbols***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***durationOfPRS-ProcessingSymbolsInEveryTms***: This field specifies the values for *T*. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280 ms.- ***maxNumOfDL-PRS-ResProcessedPerSlot***: Indicates the maximum number of DL-PRS Resources that UE can process in a slot. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands. NOTE 1: When the target device provides the *durationOfPRS-Processing* capability (*N*, *T*) for any time window defined in TS 38.214 [45] clause 5.1.6.5, the target device should be capable of processing all DL-PRS Resources within , if- where K is defined in the TS 38.214 [45] clause 5.1.6.5, and- the number of DL-PRS Resources in each slot does not exceed the *maxNumOfDL-PRS-ResProcessedPerSlot*, and- the configured measurement gap and a maximum ratio of measurement gap length (MGL) / measurement gap repetition period (MGRP) is as specified in TS 38.133 [46]. |
| ***prs-ProcessingWindowType1A***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 1A refers to the determination of prioritization between DL-PRS and other DL signals/channels in all OFDM symbols within the DL-PRS Processing Window. The DL signals/channels from all DL CCs (per UE) are affected across LTE and NR. Enumerated value indicates supported priority handing options of DL-PRS:- *option1*: Support of "st1" and "st3" defined in clause 5.1.6.5 of TS 38.214 [45].- *option2*: Support of "st1", "st2", and "st3" defined in clause 5.1.6.5 of TS 38.214 [45].- *option3*: Support of "st1" only defined in clause 5.1.6.5 of TS 38.214 [45].The UE can include this field only if the UE supports *nr-dl-aiml-prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 2: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 2a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingWindowType1B***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 1B refers to the determination of prioritization between DL-PRS and other DL signals/channels in all OFDM symbols within the DL-PRS processing window. The DL signals/channels from a certain band are affected. Enumerated value indicates supported priority handing options of DL-PRS (see *prs-ProcessingWindowType1A*).The UE can include this field only if the UE supports *nr-dl-aiml-prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 3: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 3a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingWindowType2***Indicates the supported DL-PRS processing types subject to the UE determining that DL-PRS to be higher priority for DL-PRS measurement outside MG and in a DL-PRS Processing Window.Type 2 refers to the determination of prioritization between DL-PRS and other DL signals/channels only in DL-PRS symbols within the DL-PRS processing window. Enumerated value indicates supported priority handing options of DL-PRS (see *prs-ProcessingWindowType1A*).The UE can include this field only if the UE supports *nr-dl-aiml-prs-ProcessingCapabilityBandList*. Otherwise, the UE does not include this field.NOTE 4: Within a DL-PRS processing window, UE measurement is inside the active DL BWP with DL-PRS having the same numerology as the active DL BWP.NOTE 4a: When the UE determines higher priority for other DL signals/channels over the DL-PRS measurement/processing, the UE is not expected to measure/process DL-PRS. |
| ***prs-ProcessingCapabilityOutsideMGinPPW***Indicates the DL-PRS Processing Capability outside MG of each of the supported PPW Type in the case the UE supports multiple PPW Types in a band and comprises the following subfields:- ***prsProcessingType***: Indicates the DL-PRS Processing Window Type for which the *prs-ProcessingCapabilityOutsideMGinPPW* are provided.- ***ppw-dl-PRS-BufferType***: Indicates DL-PRS buffering capability. Value '*type1'* indicates sub-slot/symbol level buffering and value '*type2'* indicates slot level buffering.- ***ppw-durationOfPRS-Processing1***: Indicates the duration of DL-PRS symbols *N* in units of ms a UE can process every *T* ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth* and comprises the following subfields:- ***ppw-durationOfPRS-ProcessingSymbolsN***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***ppw-durationOfPRS-ProcessingSymbolsT***: This field specifies the values for *T*. Enumerated values indicate 1, 2, 4, 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280 ms.- ***ppw-durationOfPRS-Processing2***: Indicates the duration of DL-PRS symbols *N2* in units of ms a UE can process in*T2* ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth* and comprises the following subfields:- ***ppw-durationOfPRS-ProcessingSymbolsN2***: This field specifies the values for *N2*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 3, 4, 5, 6, 8, 12 ms.- ***ppw-durationOfPRS-ProcessingSymbolsT2***: This field specifies the values for *T2*. Enumerated values indicate 4, 5, 6, 8 ms.- ***ppw-maxNumOfDL-PRS-ResProcessedPerSlot:*** Indicates the maximum number of DL-PRS resources that UE can process in a slot. SCS: 15 kHz, 30 kHz, 60 kHz are applicable for FR1 bands. SCS: 60 kHz, 120 kHz are applicable for FR2 bands.- ***ppw-maxNumOfDL-Bandwidth:*** Indicates the maximum number of DL-PRS bandwidth in MHz, which is supported and reported by UE for DL-PRS measurement outside MG within the PPW.The UE can include this field only if the UE supports one of *prs-ProcessingWindowType1A*, *prs-ProcessingWindowType1B* and *prs-ProcessingWindowType2*. Otherwise, the UE does not include this field.NOTE 5: A UE that supports one of *prs-ProcessingWindowType1A*, *prs-ProcessingWindowType1B* or *prs-ProcessingWindowType2* shall always include the *prs-ProcessingCapabilityOutsideMGinPPW*.NOTE 6: The (*N*, *T*) UE capability in *ppw-durationOfPRS-Processing1* is interpreted as in NOTE 1, and the UE is expected to receive the DL-PRS within the DL-PRS processing window but the processing of the received DL-PRS may be outside a DL-PRS processing window.NOTE 7: The (*N2*, *T2*) UE capability in *ppw-durationOfPRS-Processing2* is interpreted such that the UE is capable of measuring up to *N2* ms DL-PRS within a PPW and is capable of completing the DL-PRS processing within the PPW, e.g., if the time duration from the last symbol of the measured DL-PRS Resource(s) inside the PPW to the end of PPW is not smaller than *T2* ms.NOTE 8: A UE which supports *prs-ProcessingCapabilityOutsideMGinPPW* shall support either *ppw-durationOfPRS-Processing1* or *ppw-durationOfPRS-Processing2*, but not both for each supported type in a band.NOTE 9: If this group of fields is not included, but the IE *NR-DL-PRS-ProcessingCapability* is included in the *ProvideCapabilities* message body, the corresponding fields in IE *NR-DL-PRS-ProcessingCapability* (*prs-ProcessingCapabilityOutsideMGinPPW-r17*) are also applicable to NR DL AI/ML positioning. |
| ***prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 2 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED state and and comprises the following subfields:- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR1, which is supported and reported by UE.- ***maximumOfTwoAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.- ***maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL.- ***maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL.- ***dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.- ***prs-durationOfTwoPRS-BWA-Processing***: Indicates the duration of DL-PRS symbols *N* in units of ms a UE can process every *T* ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsN***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***prs-durationOfTwoPRS-BWA-ProcessingSymbolsT***: This field specifies the values for *T*. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 2560 ms.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.The UE can include this field only if the UE supports *supportedBandwidthPRS, dl-PRS-BufferType, durationOfPRS-Processing* and *maxNumOfDL-PRS-ResProcessedPerSlot*. Otherwise, the UE does not include this field.NOTE 10: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE 11: The value *N* should be equal or smaller than the value *N* reported by *durationOfPRS-ProcessingSymbols*, or this value *T* should be equal or larger than the value *T* reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE 12: Each two linked DL-PRS Resources are counted as 1 resource.NOTE 13: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot.*NOTE 14: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30%.NOTE 15: If this group of fields is not included, but the IE *NR-DL-PRS-ProcessingCapability* is included in the *ProvideCapabilities* message body, the corresponding fields in IE *NR-DL-PRS-ProcessingCapability* (*prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected-r18*) are also applicable to NR DL AI/ML positioning. |
| ***prs-BWA-ThreeContiguousIntrabandInMG-RRC-Connected***Indicates the UE capability for support of DL-PRS processing capabilities for aggregated DL-PRS processing of 3 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED state and comprises the following subfields:- ***maximumOfThreeAggregatedDL-PRS-Bandwidth-FR1***: Indicates the maximum aggregated DL-PRS bandwidth in MHz of for FR1, which is supported and reported by UE.- ***maximumOfThreeAggregatedDL-PRS-Bandwidth-FR2***: Indicates the maximum aggregated DL-PRS bandwidth in MHz for FR2, which is supported and reported by UE.- ***maximumOfDL-PRS-BandwidthPerPFL-FR1***: Indicates the maximum DL-PRS bandwidth in MHz for FR1, per PFL- ***maximumOfDL-PRS-BandwidthPerPFL-FR2***: Indicates the maximum DL-PRS bandwidth in MHz for FR2, per PFL- ***dl-PRS-BufferTypeOfBWA***: Indicates the DL-PRS buffering capability.- ***prs-durationOfThreePRS-BWA-Processing***: Indicates the duration of DL-PRS symbols *N* in units of ms a UE can process every *T* ms assuming maximum aggregated DL-PRS bandwidth in MHz, which is supported and reported by UE.- ***prs-durationOfThreePRS-BWA-ProcessingSymbolsN***: This field specifies the values for *N*. Enumerated values indicate 0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50 ms.- ***prs-durationOfThreePRS-BWA-ProcessingSymbolsT***: This field specifies the values for *T*. Enumerated values indicate 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280, 3840 ms.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR1***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR1.- ***maxNumOfAggregatedDL-PRS-ResourcePerSlot-FR2***: Indicates the Maximum number of aggregated DL-PRS Resources across aggregated PFLs that UE can process in a slot for FR2.The UE can include this field only if the UE supports *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected****.*** Otherwise, the UE does not include this field.NOTE16: *dl-PRS-BufferTypeOfBWA* follows buffering capability type reported in *dl-PRS-BufferType.*NOTE17: The value *N* should be equal or smaller than the value *N* reported by *durationOfPRS-ProcessingSymbols*, or this value *T* should be equal or larger than the value T reported by *durationOfPRS-ProcessingSymbolsInEveryTms.*NOTE18: Each three linked DL-PRS Resources are counted as 1 resource.NOTE19: *maxNumOfAggregatedDL-PRS-ResourcePerSlot* should be equal or smaller than the value reported by *maxNumOfDL-PRS-ResProcessedPerSlot*.NOTE20: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30%.NOTE 21: If this group of fields is not included, but the IE *NR-DL-PRS-ProcessingCapability* is included in the *ProvideCapabilities* message body, the corresponding fields in IE *NR-DL-PRS-ProcessingCapability* (*prs-BWA-ThreeContiguousIntrabandInMG-RRC-Connected-r18*) are also applicable to NR DL AI/ML positioning. |
| ***supportOfPRS-BWA-WithTwoPFL-Combination***Indicates whether the UE supports DL-PRS bandwidth aggregation with two PFL combinations. The UE can include this field only if the UE supports *prs-BWA-TwoContiguousIntrabandInMG-RRC-Connected*. Otherwise, the UE does not include this field. |