**3GPP TSG-RAN WG2 Meeting #123bis *draft R2-231xxxx***

**Xiamen, CN, Oct 9 - 13, 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.355** | **CR** | **draft** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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|  | | | | | | | | | | |
| ***Title:*** | LPP running CR for bandwidth aggregation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2 | | | | |  | ***Date:*** | | | 2023-09-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of bandwidth aggregation based on RAN1 agreement and RAN1 parameter list. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduction support for bandwidth aggregation with the following changes:   * Introduce finer report granularity within the measurement report for DL-TDOA and multi-RTT; * Introduce support of finer report granularity for DL-TDOA and multi-RTT; * Introduce support of NW pre-configured available on-demand PRS bandwidth aggregation configurations; * Introduce support of UE initiated on-demand PRS bandwidth aggregation configurations; * Introduce request of joint measurement based on aggregated PRS for DL-TDOA and multi-RTT; * Introduce indication of the two or three PFLs used for joint measurement for DL-TDOA and multi-RTT; * Introduce indication of the PRS resources sets across the two or three PFLs which can be used for joint measurement for DL-TDOA and multi-RTT; * Introduce indications of PRS resources sets used for joint measurements within the measurement report for DL-TDOA and multi-RTT; | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Bandwidth aggregation is not supported in NR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.4.3, 6.5.10.4, 6.5.10.5, 6.5.10.6, 6.5.12.4, 6.5.12.5, 6.5.12.6, 6.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*START OF CHANGE*

# 6 Information Element Abstract Syntax Definition

### 6.4.3 Common NR Positioning Information Elements

*– NR-AdditionalPathList*

The IE *NR-AdditionalPathList* is used by the target device to provide information about additional paths in association to the TOA measurements associated to NR positioning in the form of a relative time difference and a quality value. The additional path *nr-RelativeTimeDifference* is the detected path timing relative to the detected path timing used for the TOA value, and each additional path can be associated with a quality value *nr-PathQuality.*

-- ASN1START

NR-AdditionalPathList-r16 ::= SEQUENCE (SIZE(1..2)) OF NR-AdditionalPath-r16

NR-AdditionalPathListExt-r17 ::= SEQUENCE (SIZE(1..8)) OF NR-AdditionalPath-r16

NR-AdditionalPath-r16 ::= SEQUENCE {

nr-RelativeTimeDifference-r16 CHOICE {

k0-r16 INTEGER(0..16351),

k1-r16 INTEGER(0..8176),

k2-r16 INTEGER(0..4088),

k3-r16 INTEGER(0..2044),

k4-r16 INTEGER(0..1022),

k5-r16 INTEGER(0..511),

...,

k-1-r18 INTEGER(0..32701),

k-2-r18 INTEGER(0..65401) },

nr-PathQuality-r16 NR-TimingQuality-r16 OPTIONAL,

...,

[[

nr-DL-PRS-RSRPP-r17 INTEGER (0..126) OPTIONAL

]]

}

-- ASN1STOP

| ***NR-AdditionalPathList* field descriptions** |
| --- |
| ***nr-RelativeTimeDifference***  This field specifies the additional detected path timing relative to the detected path timing of the reference resource. The mapping of reported values and measured quantity value is defined in TS 38.133 [46] clause 10.1.23.3.3 and 10.1.25.3.3. A positive value indicates that the particular path is later in time than the detected path of the reference; a negative value indicates that the particular path is earlier in time than the detected path of the reference. |
| ***nr-PathQuality***  This field specifies the target device′s best estimate of the quality of the detected timing of the additional path. |
| ***nr-DL-PRS-RSRPP***  This field specifies the DL PRS reference signal received path power (DL PRS-RSRPP) of the *NR-AdditionalPath* reported, as defined in TS 38.215 [36]. The mapping of the quantity is defined as in TS 38.133 [46]. |

*NEXT CHANGE*

– *NR-DL-PRS-AssistanceData*

The IE *NR-DL-PRS-AssistanceData* is used by the location server to provide DL-PRS assistance data.

NOTE 1: The location server should include at least one TRP for which the SFN can be obtained by the target device, e.g. the serving TRP.

NOTE 2: The *nr-DL-PRS-ReferenceInfo* defines the "assistance data reference" TRP whose DL-PRS configuration is included in *nr-DL-PRS-AssistanceDataList*. The *nr-DL-PRS-SFN0-Offset's* and *nr-DL-PRS-expectedRSTD's* in *nr-DL-PRS-AssistanceDataList* are provided relative to the "assistance data reference" TRP.

NOTE 3: The network signals a value of zero for the *nr-DL-PRS-SFN0-Offset*, *nr-DL-PRS-expectedRSTD*, and *nr-DL-PRS-expectedRSTD-uncertainty* of the "assistance data reference" TRP in *nr-DL-PRS-AssistanceDataList*.

NOTE 4: For NR DL-TDOA positioning (see clause 6.5.10) the *nr-DL-PRS-ReferenceInfo* defines also the requested "RSTD reference".

For DL-PRS processing, the LPP layer may inform lower layers to start performing DL-PRS measurements and provide to lower layers the information about the location of DL-PRS, e.g. DL-PRS-PointA, DL-PRS Positioning occasion information.

-- ASN1START

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

nr-DL-PRS-ReferenceInfo-r16 DL-PRS-ID-Info-r16,

nr-DL-PRS-AssistanceDataList-r16 SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF

NR-DL-PRS-AssistanceDataPerFreq-r16,

nr-SSB-Config-r16 SEQUENCE (SIZE (1..nrMaxTRPs-r16)) OF

NR-SSB-Config-r16 OPTIONAL, -- Need ON

...,

[[

nr-DL-PRS-AggregationInfo-r18 NR-DL-PRS-AggregationInfo-r18 OPTIONAL -- Need ON

]]

}

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

nr-DL-PRS-PositioningFrequencyLayer-r16

NR-DL-PRS-PositioningFrequencyLayer-r16,

nr-DL-PRS-AssistanceDataPerFreq-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF

NR-DL-PRS-AssistanceDataPerTRP-r16,

...

}

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

dl-PRS-ID-r16 INTEGER (0..255),

nr-PhysCellID-r16 NR-PhysCellID-r16 OPTIONAL, -- Need ON

nr-CellGlobalID-r16 NCGI-r15 OPTIONAL, -- Need ON

nr-ARFCN-r16 ARFCN-ValueNR-r15 OPTIONAL, -- Need ON

nr-DL-PRS-SFN0-Offset-r16 NR-DL-PRS-SFN0-Offset-r16,

nr-DL-PRS-ExpectedRSTD-r16 INTEGER (-3841..3841),

nr-DL-PRS-ExpectedRSTD-Uncertainty-r16

INTEGER (0..246),

nr-DL-PRS-Info-r16 NR-DL-PRS-Info-r16,

...,

[[

prs-OnlyTP-r16 ENUMERATED { true } OPTIONAL -- Need ON

]],

[[

nr-DL-PRS-ExpectedAoD-or-AoA-r17

NR-DL-PRS-ExpectedAoD-or-AoA-r17 OPTIONAL -- Need ON

]]

}

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

dl-PRS-SubcarrierSpacing-r16 ENUMERATED {kHz15, kHz30, kHz60, kHz120, ...},

dl-PRS-ResourceBandwidth-r16 INTEGER (1..63),

dl-PRS-StartPRB-r16 INTEGER (0..2176),

dl-PRS-PointA-r16 ARFCN-ValueNR-r15,

dl-PRS-CombSizeN-r16 ENUMERATED {n2, n4, n6, n12, ...},

dl-PRS-CyclicPrefix-r16 ENUMERATED {normal, extended, ...},

...

}

NR-DL-PRS-SFN0-Offset-r16 ::= SEQUENCE {

sfn-Offset-r16 INTEGER (0..1023),

integerSubframeOffset-r16 INTEGER (0..9),

...

}

NR-DL-PRS-ExpectedAoD-or-AoA-r17 ::= CHOICE {

expectedAoD-r17 SEQUENCE {

expectedDL-AzimuthAoD-r17 INTEGER (0..359),

expectedDL-AzimuthAoD-Unc-r17 INTEGER (0..60) OPTIONAL, -- Need OP

expectedDL-ZenithAoD-r17 INTEGER (0..180),

expectedDL-ZenithAoD-Unc-r17 INTEGER (0..30) OPTIONAL -- Need OP

},

expectedAoA-r17 SEQUENCE {

expectedDL-AzimuthAoA-r17 INTEGER (0..359),

expectedDL-AzimuthAoA-Unc-r17 INTEGER (0..60) OPTIONAL, -- Need OP

expectedDL-ZenithAoA-r17 INTEGER (0..180),

expectedDL-ZenithAoA-Unc-r17 INTEGER (0..30) OPTIONAL -- Need OP

}

}

NR-DL-PRS-AggregationInfo-r18 ::= SEQUENCE (SIZE (1..nrMaxNumPRSBandWidthAggregation-r18)) OF

NR-linked-DL-PRS-ResourceSetIDList-PRS-Aggregation-r18

NR-linked-DL-PRS-ResourceSetIDList-PRS-Aggregation-r18 ::= SEQUENCE (SIZE (2..3)) OF NR-DL-PRS-AggregationElement-r18

NR-DL-PRS-AggregationElement-r18 ::= SEQUENCE {

nr-DL-PRS-FrequencyLayerIndex-r18 INTEGER (0..nrMaxFreqLayers-1-r16),

nr-DL-PRS-TRP-Index-r18 INTEGER (0..nrMaxTRPsPerFreq-1-r16),

nr-DL-PRS-ResourceSetIndex-r18 INTEGER (0..nrMaxSetsPerTrpPerFreqLayer-1-r16)

}

Editor note: it is assumed that multiple combinations of the PRS bandwidth aggregation configurations can be provided, FFS the values.

-- ASN1STOP

| ***NR-DL-PRS-AssistanceData* field descriptions** |
| --- |
| ***nr-DL-PRS-ReferenceInfo***  This field specifies the IDs of the assistance data reference TRP. |
| ***nr-DL-PRS-AssistanceDataList***  This field specifies the DL-PRS resources for each frequency layer. |
| ***nr-SSB-Config***  This field specifies the SSB configuration of the TRPs. |
| ***nr-DL-PRS-AggregationInfo***  This field specifies the DL-PRS Resource Sets across DL-PRS Positioning Frequency Layers available for DL-PRS bandwidth aggregation. The 2 or 3 DL-PRS Resource Sets indicated by IE *nr-linked-DL-PRS-ResourceSetIDList-PRSAggregation* are linked for bandwidth aggregation.  - ***nr-DL-PRS-FrequencyLayerIndex***: This field indicates the frequency layer provided in *nr-DL-PRS-AssistanceDataList*. Value 0 corresponds to the first frequency layer provided in *nr-DL-PRS-AssistanceDataList*, value 1 to the second frequency layer in *nr-DL-PRS-AssistanceDataList*, and so on.  - ***nr-DL-PRS-TRP-Index***: This field indicates the TRP/DL-PRS ID provided in *nr-DL-PRS-AssistanceDataPerFreq*. Value 0 corresponds to the first TRP/DL-PRS ID provided in *nr-DL-PRS-AssistanceDataPerFreq*, value 1 to the second TRP/DL-PRS ID in *nr-DL-PRS-AssistanceDataPerFreq*, and so on.  - ***nr-DL-PRS-ResourceSetIndex***: This field indicates the DL-PRS Resource Set in *nr-DL-PRS-ResourceSetList* in IE *NR-DL-PRS-Info*. Value 0 corresponds to the first DL-PRS Resource Set provided in *nr-DL-PRS-ResourceSetList*, value 1 to the second DL-PRS Resource Set in *nr-DL-PRS-ResourceSetList*.  NOTE: The linked DL-PRS Resource Sets from two or three Positioning Frequency Layers are from the same TRP. |
| ***nr-DL-PRS-PositioningFrequencyLayer***  This field specifies the Positioning Frequency Layer for the *nr-DL-PRS-AssistanceDataPerFreq* field. |
| ***nr-DL-PRS-AssistanceDataPerFreq***  This field specifies the DL-PRS Resources for the TRPs within the Positioning Frequency Layer. |
| ***dl-PRS-ID***  This field is used along with a DL-PRS Resource Set ID and a DL-PRS Resource ID to uniquely identify a DL-PRS Resource, and is associated with a single TRP. |
| ***nr-PhysCellID***  This field specifies the physical cell identity of the TRP. When the field *prs-OnlyTP* is included, this field is not included. |
| ***nr-CellGlobalID***  This field specifies the NCGI, the globally unique identity of a cell in NR, as defined in TS 38.331 [35]. When the field *prs-OnlyTP* is included, this field is not included. |
| ***nr-ARFCN***  This field specifies the NR-ARFCN of the TRP's CD-SSB (as defined in TS 38.300 [47]) corresponding to *nr-PhysCellID*. When the field *prs-OnlyTP* is included, this field is not included. |
| ***nr-DL-PRS-SFN0-Offset***  This field specifies the time offset of the SFN#0 slot#0 for the given TRP with respect to SFN#0 slot#0 of the assistance data reference TRP and comprises the following subfields:  - ***sfn-Offset*** specifies the SFN offset at the TRP antenna location between the assistance data reference TRP and this neighbour TRP.  The offset corresponds to the number of full radio frames counted from the beginning of a radio frame #0 of the assistance data reference TRP to the beginning of the closest subsequent radio frame #0 of this neighbour TRP.  - ***integerSubframeOffset*** specifies the frame boundary offset at the TRP antenna location between the assistance data reference TRP and this neighbour TRP counted in full subframes.  The offset corresponds to the number of full subframes counted from the beginning of a subframe #0 of the assistance data reference TRP to the beginning of the closest subsequent subframe #0 of this neighbour TRP.  NOTE: The location server sets the value in accordance with the defined search window for the target device using *nr-DL-PRS-ExpectedRSTD* and *nr-DL-PRS-ExpectedRSTD-Uncertainty*. |
| ***nr-DL-PRS-ExpectedRSTD***  This field indicates the RSTD value that the target device is expected to measure between this TRP and the assistance data reference TRP. The *nr-DL-PRS-ExpectedRSTD* field takes into account the expected propagation time difference as well as transmit time difference of PRS positioning occasions between the two TRPs. The resolution is 4×Ts, with Ts=1/(15000\*2048) seconds. |
| ***nr-DL-PRS-ExpectedRSTD-Uncertainty***  This field indicates the uncertainty in *nr-DL-PRS-ExpectedRSTD* value.The uncertainty is related to the location server′s a‑priori estimate of the target device location. The *nr-DL-PRS-ExpectedRSTD* and *nr-DL-PRS-ExpectedRSTD-Uncertainty* togetherdefine the search window for the target device.  The resolution R is  - Ts if all PRS resources are in frequency range 2,  - 4×Ts otherwise,  with Ts=1/(15000\*2048) seconds.  The target device may assume that the beginning of the subframe for the PRS of this TRP is received within the search window of size  - [*-nr-*DL*-PRS-ExpectedRSTD-Uncertainty*×R *;* *nr-DL-PRS-ExpectedRSTD-Uncertainty*×R] centred at TREF*+*1 millisecond×N+*nr-DL-PRS-ExpectedRSTD*×4×Ts,  where TREF is the reception time of the beginning of the subframe for the PRS of the assistance data reference TRP at the target device antenna connector, and N can be calculated based on  - *nr-DL-PRS-SFN0-Offset*  - *dl-PRS-Periodicity-and-ResourceSetSlotOffset*  - *dl-PRS-ResourceSlotOffset.* |
| ***nr-DL-PRS-Info***  This field specifies the PRS configuration of the TRP. |
| ***dl-PRS-SubcarrierSpacing***  This field specifies the subcarrier spacing of the DL-PRS Resource. 15, 30, 60 kHz for FR1; 60, 120 kHz for FR2. All DL-PRS Resources and DL-PRS Resource Sets in the same Positioning Frequency layer have the same value of *dl-PRS-SubcarrierSpacing*. |
| ***dl-PRS-ResourceBandwidth***  This field specifies the number of PRBs allocated for the DL-PRS Resource (allocated DL-PRS bandwidth) in multiples of 4 PRBs. All DL-PRS Resources of the DL-PRS Resource Set have the same bandwidth. All DL-PRS Resource Sets belonging to the same Positioning Frequency Layer have the same value of DL-PRS Bandwidth and Start PRB.  Integer value 1 corresponds to 24 PRBs, value 2 corresponds to 28 PRBs, value 3 corresponds to 32 PRBs and so on. |
| ***dl-PRS-StartPRB***  This field specifies the start PRB index defined as offset with respect to reference DL-PRS Point A for the Positioning Frequency Layer. All DL-PRS Resources Sets belonging to the same Positioning Frequency Layer have the same value of *dl-PRS-StartPRB*. |
| ***dl-PRS-PointA***  This field specifies the absolute frequency of the reference resource block for the DL-PRS. Its lowest subcarrier is also known as DL-PRS Point A. A single DL-PRS Point A for DL-PRS Resource allocation is provided per Positioning Frequency Layer. All DL-PRS Resources belonging to the same DL-PRS Resource Set have the same DL-PRS Point A. |
| ***dl-PRS-CombSizeN***  This field specifies the Resource Element spacing in each symbol of the DL-PRS Resource. All DL-PRS Resource Sets belonging to the same Positioning Frequency Layer have the same value of comb size N. |
| ***dl-PRS-CyclicPrefix***  This field specifies the Cyclic Prefix length of the DL-PRS Resource. All DL-PRS Resources Sets belonging to the same Positioning Frequency Layer have the same value of *dl-PRS-CyclicPrefix*. |
| ***prs-OnlyTP***  This field, if present, indicates that the *NR-DL-PRS-AssistanceData* is provided for a PRS-only TP. Whether the field is present or absent should be the same for all the *NR-DL-PRS-AssistanceData* of all the PRS transmitted under the same TP.  The target device shall not assume that any other signals or physical channels are present for the TRP other than DL-PRS. |
| ***nr-DL-PRS-ExpectedAoD-or-AoA***  This field specifies the expected AoD or AoA in the Global Coordinate System (GCS) at the target device location together with uncertainty.  - ***expectedDL-AzimuthAoD***: This field specifies the expected azimuth angle of departure. Scale factor 1 degree; range 0 to 359 degrees.  - ***expectedDL-AzimuthAoD-Unc***: This field specifies the (single-sided) uncertainty of the expected azimuth angle of departure. If this field is absent, it indicates maximum uncertainty (60 degrees). Scale factor 1 degree; range 0 to 60 degrees.  - ***expectedDL-ZenithAoD***: This field specifies the expected elevation angle of departure. Scale factor 1 degree; range 0 to 180 degrees.  - ***expectedDL-ZenithAoD-Unc***: This field specifies the (single-sided) uncertainty of the expected elevation angle of departure. If this field is absent, it indicates maximum uncertainty (30 degrees). Scale factor 1 degree; range 0 to 30 degrees.  - ***expectedDL-AzimuthAoA***: This field specifies the expected azimuth angle of arrival.  Scale factor 1 degree; range 0 to 359 degrees.  - ***expectedDL-AzimuthAoA-Unc***: This field specifies the (single-sided) uncertainty of the expected azimuth angle of arrival. If this field is absent, it indicates maximum uncertainty (60 degrees). Scale factor 1 degree; range 0 to 60 degrees.  - ***expectedDL-ZenithAoA***: This field specifies the expected elevation angle of arrival.  Scale factor 1 degree; range 0 to 180 degrees.  - ***expectedDL-ZenithAoA-Unc***: This field specifies the (single-sided) uncertainty of the expected elevation angle of arrival. If this field is absent, it indicates maximum uncertainty (30 degrees). Scale factor 1 degree; range 0 to 30 degrees. |

*NEXT CHANGE*

*– NR-On-Demand-DL-PRS-Configurations*

The IE *NR-On-Demand-DL-PRS-Configurations* provides a set of possible DL-PRS configurations and/or PRS bandwidth aggregation which can be requested by the target device on-demand.

-- ASN1START

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

on-demand-dl-prs-configuration-list-r17 SEQUENCE (SIZE (1..maxOD-DL-PRS-Configs-r17)) OF

On-Demand-DL-PRS-Configuration-r17,

...,

[[

onDemand-DL-PRS-AggregationList-r18 SEQUENCE (SIZE (1..maxOD-DL-PRS-Configs-r17)) OF

OnDemand-DL-PRS-AggregationInfo-r18

OPTIONAL

]]

}

On-Demand-DL-PRS-Configuration-r17 ::= SEQUENCE {

dl-prs-configuration-id-r17 DL-PRS-Configuration-ID-r17,

nr-DL-PRS-PositioningFrequencyLayer-r17 NR-DL-PRS-PositioningFrequencyLayer-r16,

nr-DL-PRS-Info-r17 NR-DL-PRS-Info-r16,

...

}

DL-PRS-Configuration-ID-r17 ::= SEQUENCE {

nr-dl-prs-configuration-id-r17 INTEGER (1..maxOD-DL-PRS-Configs-r17),

...

}

OnDemand-DL-PRS-AggregationInfo-r18 ::= SEQUENCE (SIZE (2..3)) OF DL-PRS-Configuration-ID-r17

-- ASN1STOP

| ***NR-On-Demand-DL-PRS-Configurations* field descriptions** |
| --- |
| ***dl-prs-configuration-id***  This field provides an identity for the *On-Demand-DL-PRS-Configuration.* |
| ***nr-DL-PRS-PositioningFrequencyLayer***  This field, together with *nr-DL-PRS-Info*, provides the On-demand DL-PRS Configuration information.  Only the following fields in IE *NR-DL-PRS-PositioningFrequencyLayer* are applicable:  *dl-PRS-ResourceBandwidth*, *dl-PRS-CombSizeN.*  The target device shall ignore the remaining fields in IE *NR-DL-PRS-PositioningFrequencyLayer.* |
| ***nr-DL-PRS-Info***  This field, together with *nr-DL-PRS-PositioningFrequencyLayer*, provides the On-demand DL-PRS Configuration information. Only the following fields in IE *NR-DL-PRS-Info* are applicable:  DL-PRS periodicity in *dl-PRS-Periodicity-and-ResourceSetSlotOffset*, *dl-PRS-ResourceRepetitionFactor*, *dl-PRS-NumSymbols*, comb-size in *dl-PRS-CombSizeN-AndReOffset*, *dl-PRS-QCL-Info*.  The target device shall ignore the remaining fields in IE *NR-DL-PRS-Info.* |
| ***onDemand-DL-PRS-Aggregationlist***  This field indicates the 2 or 3 *DL-PRS-Configuration-ID*'s whose corresponding *On-Demand-DL-PRS-Configuration*'s are available for DL-PRS aggregation. |

*NEXT CHANGE*

– *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 and/or on-demand PRS bandwidth aggregation 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-OnDemand-DL-PRS-AggregationReqList-r18 SEQUENCE (SIZE (1..maxOD-DL-PRS-Configs-r17)) OF

NR-OnDemand-DL-PRS-AggregationReqElement-r18

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-OnDemand-DL-PRS-AggregationReqElement-r18 ::= SEQUENCE (SIZE (2..3)) OF   
 INTEGER (1..nrMaxFreqLayers-r16)

-- 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-AggregationIDPrefList***  This field specifies the on-demand DL-PRS aggregated configuration associated with *onDemand-DL-PRS-AggregationList* in IE *NR-On-Demand-DL-PRS-Configurations* the target device wishes to obtain in the order of preference. The first integer value in the list is the most preferred aggregated configuration; the second integer value in the list is the second most preferred, etc. The integer value corresponds to the entry in the field *onDemand-DL-PRS-AggregationLis*t in IE *NR-On-Demand-DL-PRS-Configurations*. |
| ***nr-OnDemand-DL-PRS-AggregationReqList***  This field specifies the aggregated on-demand DL-PRS configuration information requested by the target device in the order of preference. The first *NR-OnDemand-DL-PRS-AggregationReqElement* in the list is the most preferred aggregated configuration; the second element in the list is the second most preferred, etc. The integer value in *NR-OnDemand-DL-PRS-AggregationReqElement* corresponds to the entry in the IE *NR-On-Demand-DL-PRS-Information*. |

*NEXT CHANGE*

6.5.10.4 NR DL-TDOA Location Information Elements

– *NR-DL-TDOA-SignalMeasurementInformation*

The IE *NR-DL-TDOA-SignalMeasurementInformation* is used by the target device to provide NR DL-TDOA measurements to the location server.

NOTE 1: The *dl-PRS-ReferenceInfo* defines the "RSTD reference" TRP. The *nr-RSTD's* and *nr-RSTD-ResultDiff*'s in *nr-DL-TDOA-MeasList* are provided relative to the "RSTD reference" TRP.

NOTE 2: The "RSTD reference" TRP may or may not be the same as the "assistance data reference" TRP provided by *nr-DL-PRS-ReferenceInfo* in IE *NR-DL-PRS-AssistanceData.*

NOTE 3: The target device includes a value of zero for the *nr-RSTD* and *nr-RSTD-ResultDiff* of the "RSTD reference" TRP in *nr-DL-TDOA-MeasList*.

-- ASN1START

NR-DL-TDOA-SignalMeasurementInformation-r16 ::= SEQUENCE {

dl-PRS-ReferenceInfo-r16 DL-PRS-ID-Info-r16,

nr-DL-TDOA-MeasList-r16 NR-DL-TDOA-MeasList-r16,

...,

[[

nr-UE-RxTEG-TimingErrorMargin-r17 TEG-TimingErrorMargin-r17 OPTIONAL -- Cond UERxTEG

]]

}

NR-DL-TDOA-MeasList-r16 ::= SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-DL-TDOA-MeasElement-r16

NR-DL-TDOA-MeasElement-r16 ::= SEQUENCE {

dl-PRS-ID-r16 INTEGER (0..255),

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

nr-CellGlobalID-r16 NCGI-r15 OPTIONAL,

nr-ARFCN-r16 ARFCN-ValueNR-r15 OPTIONAL,

nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,

nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-TimeStamp-r16 NR-TimeStamp-r16,

nr-RSTD-r16 CHOICE {

k0-r16 INTEGER (0..1970049),

k1-r16 INTEGER (0..985025),

k2-r16 INTEGER (0..492513),

k3-r16 INTEGER (0..246257),

k4-r16 INTEGER (0..123129),

k5-r16 INTEGER (0..61565),

...,

k-1-r18 INTEGER (0..3940097),

k-2-r18 INTEGER (0..7880193)

},

nr-AdditionalPathList-r16 NR-AdditionalPathList-r16 OPTIONAL,

nr-TimingQuality-r16 NR-TimingQuality-r16,

nr-DL-PRS-RSRP-Result-r16 INTEGER (0..126) OPTIONAL,

nr-DL-TDOA-AdditionalMeasurements-r16

NR-DL-TDOA-AdditionalMeasurements-r16 OPTIONAL,

...,

[[

nr-UE-Rx-TEG-ID-r17 INTEGER (0..maxNumOfRxTEGs-1-r17) OPTIONAL,

nr-DL-PRS-FirstPathRSRP-Result-r17 INTEGER (0..126) OPTIONAL,

nr-los-nlos-Indicator-r17 CHOICE {

perTRP-r17 LOS-NLOS-Indicator-r17,

perResource-r17 LOS-NLOS-Indicator-r17

} OPTIONAL,

nr-AdditionalPathListExt-r17 NR-AdditionalPathListExt-r17 OPTIONAL,

nr-DL-TDOA-AdditionalMeasurementsExt-r17

NR-DL-TDOA-AdditionalMeasurementsExt-r17 OPTIONAL

]],

[[

nr-RSTD-BasedOnAggregatedResources-r18 BOOLEAN OPTIONAL,

nr-Aggregated-DL-PRS-ResourceSetIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourceSetsPerTRP-r18)) OF NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-Aggregated-DL-PRS-ResourceIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourcesPerResourceSet-r18)) OF NR-DL-PRS-ResourceID-r16 OPTIONAL

]]

}

Editor notes: It is assumed that UE also need to indicate the PRS resource index uses for joint measurements. We can check with RAN1 later if there are different views.

Editor notes: From rapporteur’s aspect, since anway UE need to report the aggregated resource set/resource information to LMF for joint measurements, the indication that whether the measurements is joint measurements may be not needed. Companies are encougred to dicuss whether this is needed.

NR-DL-TDOA-AdditionalMeasurements-r16 ::= SEQUENCE (SIZE (1..3)) OF

NR-DL-TDOA-AdditionalMeasurementElement-r16

NR-DL-TDOA-AdditionalMeasurementsExt-r17 ::= SEQUENCE (SIZE (1..maxAddMeasTDOA-r17)) OF

NR-DL-TDOA-AdditionalMeasurementElement-r16

NR-DL-TDOA-AdditionalMeasurementElement-r16 ::= SEQUENCE {

nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,

nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-TimeStamp-r16 NR-TimeStamp-r16,

nr-RSTD-ResultDiff-r16 CHOICE {

k0-r16 INTEGER (0..8191),

k1-r16 INTEGER (0..4095),

k2-r16 INTEGER (0..2047),

k3-r16 INTEGER (0..1023),

k4-r16 INTEGER (0..511),

k5-r16 INTEGER (0..255),

...,

k-1-r18 INTEGER (0..16381),

k-2-r18 INTEGER (0..32761)

},

nr-TimingQuality-r16 NR-TimingQuality-r16,

nr-DL-PRS-RSRP-ResultDiff-r16 INTEGER (0..61) OPTIONAL,

nr-AdditionalPathList-r16 NR-AdditionalPathList-r16 OPTIONAL,

...,

[[

nr-UE-Rx-TEG-ID-r17 INTEGER (0..maxNumOfRxTEGs-1-r17) OPTIONAL,

nr-DL-PRS-FirstPathRSRP-ResultDiff-r17

INTEGER (0..61) OPTIONAL,

nr-los-nlos-IndicatorPerResource-r17

LOS-NLOS-Indicator-r17 OPTIONAL,

nr-AdditionalPathListExt-r17 NR-AdditionalPathListExt-r17 OPTIONAL

]],

[[

nr-RSTD-BasedOnAggregatedResources-r18 BOOLEAN OPTIONAL,

nr-Aggregated-DL-PRS-ResourceSetIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourceSetsPerTRP-r18)) OF NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-Aggregated-DL-PRS-ResourceIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourcesPerResourceSet-r18)) OF NR-DL-PRS-ResourceID-r16 OPTIONAL

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *UERxTEG* | The field is optionally present, need OP, if the field *nr-UE-Rx-TEG-ID* is present; otherwise it is not present. |

|  |
| --- |
| ***NR-DL-TDOA-SignalMeasurementInformation* field descriptions** |
| ***nr-UE-RxTEG-TimingErrorMargin***  This field specifies the UE Rx TEG timing error margin value for all the UE Rx TEGs within one *NR-DL-TDOA-SignalMeasurementInformation*. If the *nr-UE-Rx-TEG-ID* is present and this field is absent, the receiver should consider the UE Rx TEG timing error margin value to be the maximum applicable value as defined in TS 38.133 [46]. |
| ***dl-PRS-ID***  This field is used along with a DL-PRS Resource Set ID and a DL-PRS Resources ID to uniquely identify a DL-PRS Resource. This ID can be associated with multiple DL-PRS Resource Sets associated with a single TRP.  Each TRP should only be associated with one such ID. |
| ***nr-PhysCellID***  This field specifies the physical cell identity of the associated TRP, as defined in TS 38.331 [35]. |
| ***nr-CellGlobalID***  This field specifies the NCGI, the globally unique identity of a cell in NR, of the associated TRP, as defined in TS 38.331 [35]. |
| ***nr-ARFCN***  This field specifies the NR-ARFCN of the TRP's CD-SSB (as defined in TS 38.300 [47]) corresponding to *nr-PhysCellID*. |
| ***nr-TimeStamp***  This field specifies the time instance at which the TOA and DL PRS-RSRP/RSRPP (if included) measurement is performed. The *nr-SFN* and *nr-Slot* in IE *NR-TimeStamp* correspond to the TRP provided in *dl-PRS-ReferenceInfo* as specified in TS 38.214 [45]. Note, the TOA measurement refers to the TOA of this neighbour TRP or the reference TRP, as applicable, used to determine the *nr-RSTD* or *nr-RSTD-ResultDiff*. |
| ***nr-RSTD***  This field specifies the relative timing difference between this neighbour TRP and the PRS reference TRP, as defined in TS 38.215 [36]. Mapping of the measured quantity is defined as in TS 38.133 [46]. |
| ***nr-AdditionalPathList***  This field specifies one or more additional detected path timing values for the TRP or resource, relative to the path timing used for determining the *nr-RSTD* value. If this field was requested but is not included, it means the UE did not detect any additional path timing values. If this field is present, the field *nr-AdditionalPathListExt* shall be absent. |
| ***nr-TimingQuality***  This field specifies the target device′s best estimate of the quality of the TOA measurement. Note, the TOA measurement refers to the TOA of this neighbour TRP or the reference TRP, as applicable, used to determine the *nr-RSTD* or *nr-RSTD-ResultDiff*. |
| ***nr-DL-PRS-RSRP-Result***  This field specifies the NR DL-PRS reference signal received power (DL PRS-RSRP) measurement, as defined in TS 38.215 [36]. The mapping of the quantity is defined as in TS 38.133 [46]. |
| ***nr-DL-TDOA-AdditionalMeasurements***  This field provides up to 3 additional RSTD measurements per pair of TRPs, with each measurement between a different pair of DL-PRS Resources or DL-PRS Resource Sets of the DL-PRS for those TRPs [45].  If this field is present, the field *nr-DL-TDOA-AdditionalMeasurementsExt* shall be absent. |
| ***nr-UE-Rx-TEG-ID***  This field provides the ID of the UE Rx TEG associated with the TOA measurement. Note, the TOA measurement refers to the TOA of this neighbour TRP or the reference TRP, as applicable, used to determine the *nr-RSTD* or *nr-RSTD-ResultDiff*. When different UE Rx TEGs for RSTD measurements are requested, the maximum number of reported RSTD measurements associated with different DL-PRS Resources per UE Rx TEG per target TRP is 4. |
| ***nr-DL-PRS-FirstPathRSRP-Result***  This field specifies the NR DL-PRS reference signal received path power (DL PRS-RSRPP) of the first detected path in time, as defined in TS 38.215 [36]. The mapping of the measured quantity is defined as in TS 38.133 [46]. |
| ***nr-los-nlos-Indicator***  This field specifies the target device's best estimate of the LOS or NLOS of the TOA measurement for the TRP or resource. Note, the TOA measurement refers to the TOA of this neighbour TRP or the reference TRP, as applicable, used to determine the *nr-RSTD* or *nr-RSTD-ResultDiff*.  NOTE: If the requested type or granularity in *nr-los-nlos-IndicatorRequest* is not possible, the target device may provide a different type and granularity for the estimated *LOS-NLOS-Indicator.* |
| ***nr-AdditionalPathListExt***  This field provides up to 8 additional detected path timing values for the TRP or resource, relative to the path timing used for determining the *nr-RSTD* value. If this field was requested but is not included, it means the UE did not detect any additional path timing values. If this field is present, the field *nr-AdditionalPathList* shall be absent. |
| ***nr-DL-TDOA-AdditionalMeasurementsExt***  This field, in addition to the measurements provided in *NR-DL-TDOA-MeasElement*, provides TOA measurements of up to 4 DL-PRS Resources of a TRP with different UE Rx TEGs. For a certain DL-PRS Resource, there can be up to 8 TOA measurement results with respect to different Rx TEGs.  If this field is present, the field *nr-DL-TDOA-AdditionalMeasurements* shall be absent. |
| ***nr-RSTD-ResultDiff***  This field provides the additional DL RSTD measurement result relative to *nr-RSTD.* The RSTD value of this measurement is obtained by adding the value of this field to the value of the *nr-RSTD* field. The mapping of the field is defined in TS 38.133 [46]. |
| ***nr-DL-PRS-RSRP-ResultDiff***  This field provides the additional DL-PRS RSRP measurement result relative to *nr-DL-PRS-RSRP-Result.* The DL-PRS RSRP value of this measurement is obtained by adding the value of this field to the value of the *nr-DL-PRS-RSRP-Result* field. The mapping of the field is defined in TS 38.133 [46]. |
| ***nr-Aggregated-DL-PRS-ResourceSetIDList***  This field provides the PRS resource set IDs for the aggregated measurement which are used for RSRP/RSRPP and/or timing measurement results. The list has the same number of entries of the *nr-aggregated-DL-PRS-ResourceIDList*. |
| ***nr-Aggregated-DL-PRS-ResourceIDList***  This field provides the PRS resource IDs for the aggregated measurement which are used for RSRP/RSRPP and/or timing measurement results. The list has the same number of entries of the *nr-aggregated-DL-PRS-ResourceSetIDList*, and the the resource ID belongs to the resource set in the same position of the list *nr-aggregated-DL-PRS-ResourceSetIDList*. |
| ***nr-RSTD-BasedOnAggregatedResources***  This field indicates whether the measurement is based on aggregation across PFLs for Multi-RTT. |
| ***nr-DL-PRS-FirstPathRSRP-ResultDiff***  This field specifies the additional NR DL PRS reference signal received path power (DL PRS-RSRPP) of the first detected path in time relative to *nr-DL-PRS-FirstPathRSRP-Result*. The DL-PRS RSRPP of first path value of this measurement is obtained by adding the value of this field to the value of the *nr-DL-PRS-FirstPathRSRP-Result* field. The mapping of the field is defined in TS 38.133 [46]. |
| ***nr-los-nlos-IndicatorPerResource***  This field specifies the target device's best estimate of the LOS or NLOS of the TOA measurement for the resource. Note, the TOA measurement refers to the TOA of this neighbour TRP or the reference TRP, as applicable, used to determine the *nr-RSTD* or *nr-RSTD-ResultDiff*.  This field may only be present if the field *nr-LOS-NLOS-Indicator* choice indicates *perResource*. |

*NEXT CHANGE*

6.5.10.5 NR DL-TDOA Location Information Request

– *NR-DL-TDOA-RequestLocationInformation*

The IE *NR-DL-TDOA-RequestLocationInformation* is used by the location server to request NR DL-TDOA location measurements from a target device.

-- ASN1START

NR-DL-TDOA-RequestLocationInformation-r16 ::= SEQUENCE {

nr-DL-PRS-RstdMeasurementInfoRequest-r16 ENUMERATED { true } OPTIONAL,-- Need ON

nr-RequestedMeasurements-r16 BIT STRING { prsrsrpReq (0),

firstPathRsrpReq-r17 (1),

jointMeasurementsReq-r18 (2)

} (SIZE(1..8)),

nr-AssistanceAvailability-r16 BOOLEAN,

nr-DL-TDOA-ReportConfig-r16 NR-DL-TDOA-ReportConfig-r16 OPTIONAL, -- Need ON

additionalPaths-r16 ENUMERATED { requested } OPTIONAL, -- Need ON

...,

[[

nr-UE-RxTEG-Request-r17 ENUMERATED { requested } OPTIONAL, -- Need ON

nr-los-nlos-IndicatorRequest-r17 SEQUENCE {

type-r17 LOS-NLOS-IndicatorType1-r17,

granularity-r17 LOS-NLOS-IndicatorGranularity1-r17,

...

} OPTIONAL, -- Need ON

additionalPathsExt-r17 ENUMERATED { requested } OPTIONAL, -- Need ON

additionalPathsDL-PRS-RSRP-Request-r17 ENUMERATED { requested } OPTIONAL, -- Need ON

multiMeasInSameReport-r17 ENUMERATED { requested } OPTIONAL -- Need ON

]],

[[

nr-DL-PRS-JointMeasurementRequested-r18 INTEGER (1..nrMaxNumPRSBandWidthAggregation-r18)

OPTIONAL -- Need ON

]]

}

NR-DL-TDOA-ReportConfig-r16 ::= SEQUENCE {

maxDL-PRS-RSTD-MeasurementsPerTRP-Pair-r16 INTEGER (1..4) OPTIONAL, -- Need ON

timingReportingGranularityFactor-r16 INTEGER (0..5) OPTIONAL, -- Need ON

...,

[[

measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17

ENUMERATED { n0, n2, n3, n4, n6, n8, ... }

OPTIONAL, -- Need ON

reducedDL-PRS-ProcessingSamples-r17 ENUMERATED { requested, ... } OPTIONAL, -- Need ON

lowerRxBeamSweepingFactor-FR2-r17 ENUMERATED { requested } OPTIONAL -- Need ON

]],

[[

timingReportingGranularityFactor-Ext-r18 INTEGER (6..7) OPTIONAL -- Need ON

]]

}

-- ASN1STOP

|  |
| --- |
| ***NR-DL-TDOA-RequestLocationInformation* field descriptions** |
| ***nr-DL-PRS-RstdMeasurementInfoRequest***  This field indicates whether the target device is requested to report DL-PRS Resource ID(s) or DL-PRS Resource Set ID(s) used for determining the timing of each TRP in RSTD measurements. |
| ***nr-RequestedMeasurements***  This field specifies the NR DL-TDOA measurements requested. This is represented by a bit string, with a one‑value at the bit position means the particular measurement is requested; a zero‑value means not requested. |
| ***nr-AssistanceAvailability***  This field indicates whether the target device may request additional PRS assistance data from the server. TRUE means allowed and FALSE means not allowed. |
| ***additionalPaths***  This field, if present, indicates that the target device is requested to provide the *nr-AdditionalPathList* in IE *NR-DL-TDOA-SignalMeasurementInformation*. If this field is present, the field *additionalPathsExt* shall be absent. |
| ***nr-UE-RxTEG-Request***  This field, if present, indicates that the target device is requested to provide the *nr-UE-Rx-TEG-ID* in IE *NR-DL-TDOA-SignalMeasurementInformation.* |
| ***nr-los-nlos-IndicatorRequest***  This field, if present, indicates that the target device is requested to provide the indicated type and granularity of the estimated *LOS-NLOS-Indicator* in the *NR-DL-TDOA-SignalMeasurementInformation*. |
| ***additionalPathsExt***  This field, if present, indicates that the target device is requested to provide the *nr-AdditionalPathListExt* in IE *NR-DL-TDOA-SignalMeasurementInformation*. If this field is present, the field *additionalPaths* shall be absent. |
| ***additionalPathsDL-PRS-RSRP-Request***  This field, if present, indicates that the target device is requested to provide the *nr-DL-PRS-RSRPP* for the additional paths in fields *nr-AdditionalPathList* or *nr-AdditionalPathListExt*. |
| ***multiMeasInSameReport***  This field, if present, indicates that the target device is requested to provide multiple measurement instances in a single measurement report; i.e., include the *nr-DL-TDOA-SignalMeasurementInstances* (in the case of UE-assisted mode is requested) or *nr-DL-TDOA-LocationInformationInstances* (in the case of UE-based mode is requested) in IE *NR-DL-TDOA-ProvideLocationInformation.* |
| ***maxDL-PRS-RSTD-MeasurementsPerTRP-Pair***  This field specifies the maximum number of DL-PRS RSTD measurements per pair of TRPs. The maximum number is defined across all Positioning Frequency Layers. |
| ***timingReportingGranularityFactor, timingReportingGranularityFactor-Ext***  This field specifies the recommended reporting granularity for the DL RSTD measurements. Value (0..5) corresponds to (*k0*..*k5*) and value (6..7) corresponds to (k-1..k-2) used for *nr-RSTD* and *nr-RSTD-ResultDiff* in *NR-DL-TDOA-MeasElement*. The UE may select a different granularity value for *nr-RSTD* and *nr-RSTD-ResultDiff*. |
| ***measureSameDL-PRS-ResourceWithDifferentRxTEGs***  This field, if present, indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with *N* different UE Rx TEGs. Enumerated value '*n0*' indicates that the number *N* of different UE Rx TEGs to measure the same DL PRS Resource can be determined by the target device, value '*n2*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 2 different UE Rx TEGs, value '*n3*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 3 different UE Rx TEGs, and so on.  If this field is present, the field *nr-UE-RxTEG-Request* should also be present. |
| ***nr-DL-PRS-JointMeasurementRequested***  This field indicates Request from the LMF to the UE indicating which two or three PFLs to be used for performing joint measurement. |
| ***reducedDL-PRS-ProcessingSamples***  This field, if present and set to '*requested*', indicates that the target device is requested to perform the requested measurements with reduced number of samples (M=1 or M=2) as specified in TS 38.133 [46]. |
| ***lowerRxBeamSweepingFactor-FR2***  This field, if present, indicates that the target device is requested to use a lower Rx beam sweeping factor than 8 for FR2 according to UE's capability. |

*NEXT CHANGE*

6.5.10.6 NR DL-TDOA Capability Information

– *NR-DL-TDOA-ProvideCapabilities*

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

-- ASN1START

NR-DL-TDOA-ProvideCapabilities-r16 ::= SEQUENCE {

nr-DL-TDOA-Mode-r16 PositioningModes,

nr-DL-TDOA-PRS-Capability-r16 NR-DL-PRS-ResourcesCapability-r16,

nr-DL-TDOA-MeasurementCapability-r16 NR-DL-TDOA-MeasurementCapability-r16,

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

nr-DL-PRS-ProcessingCapability-r16 NR-DL-PRS-ProcessingCapability-r16,

additionalPathsReport-r16 ENUMERATED { supported } OPTIONAL,

periodicalReporting-r16 PositioningModes OPTIONAL,

...,

[[

ten-ms-unit-ResponseTime-r17 PositioningModes OPTIONAL,

nr-PosCalcAssistanceSupport-r17 BIT STRING { trpLocSup (0),

beamInfoSup (1),

rtdInfoSup (2),

trpTEG-InfoSup (3)

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

nr-los-nlos-AssistanceDataSupport-r17 SEQUENCE {

type-r17 LOS-NLOS-IndicatorType2-r17,

granularity-r17 LOS-NLOS-IndicatorGranularity2-r17,

...

} OPTIONAL,

nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r17 BIT STRING { eAoD (0),

eAoA (1)

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

nr-DL-TDOA-On-Demand-DL-PRS-Support-r17 NR-On-Demand-DL-PRS-Support-r17 OPTIONAL,

nr-los-nlos-IndicatorSupport-r17 SEQUENCE {

type-r17 LOS-NLOS-IndicatorType2-r17,

granularity-r17 LOS-NLOS-IndicatorGranularity2-r17,

...

} OPTIONAL,

additionalPathsExtSupport-r17 ENUMERATED { n4, n6, n8 } OPTIONAL,

scheduledLocationRequestSupported-r17 ScheduledLocationTimeSupportPerMode-r17 OPTIONAL,

nr-dl-prs-AssistanceDataValidity-r17 SEQUENCE {

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

} OPTIONAL,

multiMeasInSameMeasReport-r17 ENUMERATED { supported } OPTIONAL,

mg-ActivationRequest-r17 ENUMERATED { supported } OPTIONAL

]],

[[

posMeasGapSupport-r17 ENUMERATED { supported } OPTIONAL

]],

[[

finerReportingGranularitySupport-r18 ENUMERATED { supported } OPTIONAL

]]

}

-- ASN1STOP

|  |
| --- |
| ***NR-DL-TDOA-ProvideCapabilities* field descriptions** |
| ***nr-DL-TDOA-Mode***  This field specifies the NR DL-TDOA mode(s) supported by the target device. |
| ***periodicalReporting***  This field, if present, specifies the positioning modes for which the target device supports *periodicalReporting.* This is represented by a bit string, with a one‑value at the bit position means *periodicalReporting* for the positioning mode is supported; a zero‑value means not supported. If this field is absent, the target device does not support *periodicalReporting* in *CommonIEsRequestLocationInformation*. |
| ***ten-ms-unit-ResponseTime***  This field, if present, specifies the positioning modes for which the target device supports the enumerated value '*ten-milli-seconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. This is represented by a bit string, with a one‑value at the bit position means '*ten-milli-seconds'* response time unit for the positioning mode is supported; a zero‑value means not supported. If this field is absent, the target device does not support '*ten-milli-seconds'* response time unitin *CommonIEsRequestLocationInformation*. |
| ***nr-PosCalcAssistanceSupport***  This field indicates the Position Calculation Assistance Data supported by the target device for UE-based DL-TDOA. 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. The UE can indicate this bit only if the UE supports *prs-ProcessingCapabilityBandList* and any of *maxNrOfDL-PRS-ResourceSetPerTrpPerFrequencyLayer*, *maxNrOfTRP-AcrossFreqs*, *maxNrOfPosLayer*, *maxNrOfDL-PRS-ResourcesPerResourceSet* and *maxNrOfDL-PRS-ResourcesPerPositioningFrequencylayer*. Otherwise, the UE does not include this field. |
| ***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 *nr-los-nlos-indicator* in IE *NR-DL-PRS-ExpectedLOS-NLOS-Assistance* '*per-trp*', '*per-resource*', or both.  The UE can include this field only if the UE supports one of *maxDL-PRS-RSRP-MeasurementFR1*, *maxDL-PRS-RSRP-MeasurementFR2*, *dl-RSTD-MeasurementPerPairOfTRP-FR1*, *dl-RSTD-MeasurementPerPairOfTRP-FR*2, *maxNrOfRx-TX-MeasFR1*, *maxNrOfRx-TX-MeasFR2*, *supportOfRSRP-MeasFR1* and *supportOfRSRP-MeasFR2*. Otherwise, the UE does not include this field. |
| ***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-TDOA-On-Demand-DL-PRS-Support***  This field, if present, indicates that the target device supports on-demand DL-PRS requests. |
| ***nr-los-nlos-IndicatorSupport***  This field, if present, indicates that the target device supports *nr-los-nlos-Indicator* reporting in IE *NR-DL-TDOA-SignalMeasurementInformation*.  - *type* indicates whether the target device supports '*hard*' value or '*hard*' and '*soft*' value in IE *LOS-NLOS-Indicator.*  - *granularity* indicates whether the target device supports *LOS-NLOS-Indicator* reporting per TRP, per DL-PRS Resource, or both.  NOTE: A single value is reported when both Multi-RTT and DL-TDOA are supported. |
| ***additionalPathsExtSupport***  This field, if present, indicates that the target device supports the *nr-AdditionalPathListExt* reporting in IE *NR-DL-TDOA-SignalMeasurementInformation*. The enumerated value indicates the number of additional paths supported by the target device.  NOTE: The *supportOfDL-PRS-FirstPathRSRP* in IE *NR-DL-TDOA-MeasurementCapability* also applies to the additional paths. |
| ***scheduledLocationRequestSupported***  This field, if present, specifies the positioning modes for which 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 for each positioning mode. If this field is absent, the target device does not support scheduled location requests. |
| ***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*.* |
| ***multiMeasInSameMeasReport***  This field, if present, indicates that the target device supports multiple measurement instances in a single measurement report. |
| ***mg-ActivationRequest***  This field, if present, indicates that the target device supports UL MAC CE for positioning measurement gap activation/deactivation request for DL-PRS measurements. The UE can include this field only if the UE supports *mg-ActivationRequestPRS-Meas* and *mg-ActivationCommPRS-Meas* defined in TS 38.331 [35]. |
| ***posMeasGapSupport***  This field, if present, indicates that the target device supports pre-configured positioning measurement gap for DL-PRS measurements. The UE can include this field only if the UE supports *mg-ActivationCommPRS-Meas* defined in TS 38.331 [35]. |
| ***finerReportingGranularitySupport***  This field, if present, indicates that the target device supports finer measurement reporting granularity for RSTD measurement for k-1 and k-2 as in clause 6.5.12.4. |

*NEXT CHANGE*

#### 6.5.12.4 NR Multi-RTT Location Information Elements

#### – *NR-Multi-RTT-SignalMeasurementInformation*

The IE *NR-Multi-RTT-SignalMeasurementInformation* is used by the target device to provide NR Multi-RTT measurements to the location server.

-- ASN1START

NR-Multi-RTT-SignalMeasurementInformation-r16 ::= SEQUENCE {

nr-Multi-RTT-MeasList-r16 NR-Multi-RTT-MeasList-r16,

nr-NTA-Offset-r16 ENUMERATED { nTA1, nTA2, nTA3, nTA4, ... } OPTIONAL,

...,

[[

nr-SRS-TxTEG-Set-r17 SEQUENCE (SIZE(1..maxTxTEG-Sets-r17)) OF

NR-SRS-TxTEG-Element-r17 OPTIONAL

-- Cond Case2-3

]],

[[

nr-UE-RxTEG-TimingErrorMargin-r17 TEG-TimingErrorMargin-r17 OPTIONAL,-- Cond TEGCase3

nr-UE-TxTEG-TimingErrorMargin-r17 TEG-TimingErrorMargin-r17 OPTIONAL,-- Cond TEGCase2-3

nr-UE-RxTxTEG-TimingErrorMargin-r17 RxTxTEG-TimingErrorMargin-r17 OPTIONAL -- Cond TEGCase1-2

]]

}

NR-Multi-RTT-MeasList-r16 ::= SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-Multi-RTT-MeasElement-r16

NR-Multi-RTT-MeasElement-r16 ::= SEQUENCE {

dl-PRS-ID-r16 INTEGER (0..255),

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

nr-CellGlobalID-r16 NCGI-r15 OPTIONAL,

nr-ARFCN-r16 ARFCN-ValueNR-r15 OPTIONAL,

nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,

nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-UE-RxTxTimeDiff-r16 CHOICE {

k0-r16 INTEGER (0..1970049),

k1-r16 INTEGER (0..985025),

k2-r16 INTEGER (0..492513),

k3-r16 INTEGER (0..246257),

k4-r16 INTEGER (0..123129),

k5-r16 INTEGER (0..61565),

...,

k-1-r18 INTEGER (0..3940097),

k-2-r18 INTEGER (0..7880193)

},

nr-AdditionalPathList-r16 NR-AdditionalPathList-r16 OPTIONAL,

nr-TimeStamp-r16 NR-TimeStamp-r16,

nr-TimingQuality-r16 NR-TimingQuality-r16,

nr-DL-PRS-RSRP-Result-r16 INTEGER (0..126) OPTIONAL,

nr-Multi-RTT-AdditionalMeasurements-r16

NR-Multi-RTT-AdditionalMeasurements-r16 OPTIONAL,

...,

[[

nr-UE-RxTx-TEG-Info-r17 NR-UE-RxTx-TEG-Info-r17 OPTIONAL,

nr-DL-PRS-FirstPathRSRP-Result-r17 INTEGER (0..126) OPTIONAL,

nr-los-nlos-Indicator-r17 CHOICE {

perTRP-r17 LOS-NLOS-Indicator-r17,

perResource-r17 LOS-NLOS-Indicator-r17

} OPTIONAL,

nr-AdditionalPathListExt-r17 NR-AdditionalPathListExt-r17 OPTIONAL,

nr-Multi-RTT-AdditionalMeasurementsExt-r17

NR-Multi-RTT-AdditionalMeasurementsExt-r17 OPTIONAL

]],

[[

nr-UE-RxTxTimeDiff-BasedOnAggregatedResources-r18 BOOLEAN OPTIONAL,

nr-Aggregated-DL-PRS-ResourceSetIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourceSetsPerTRP-r18)) OF NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-Aggregated-DL-PRS-ResourceIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourcesPerResourceSet-r18)) OF NR-DL-PRS-ResourceID-r16 OPTIONAL

]]

}

NR-Multi-RTT-AdditionalMeasurements-r16 ::= SEQUENCE (SIZE (1..3)) OF

NR-Multi-RTT-AdditionalMeasurementElement-r16

NR-Multi-RTT-AdditionalMeasurementsExt-r17 ::= SEQUENCE (SIZE (1..maxAddMeasRTT-r17)) OF

NR-Multi-RTT-AdditionalMeasurementElement-r16

NR-Multi-RTT-AdditionalMeasurementElement-r16 ::= SEQUENCE {

nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,

nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-DL-PRS-RSRP-ResultDiff-r16 INTEGER (0..61) OPTIONAL,

nr-UE-RxTxTimeDiffAdditional-r16 CHOICE {

k0-r16 INTEGER (0..8191),

k1-r16 INTEGER (0..4095),

k2-r16 INTEGER (0..2047),

k3-r16 INTEGER (0..1023),

k4-r16 INTEGER (0..511),

k5-r16 INTEGER (0..255),

... ,

k-1-r18 INTEGER (0..16381),

k-2-r18 INTEGER (0..32761)

},

nr-TimingQuality-r16 NR-TimingQuality-r16,

nr-AdditionalPathList-r16 NR-AdditionalPathList-r16 OPTIONAL,

nr-TimeStamp-r16 NR-TimeStamp-r16,

...,

[[

nr-UE-RxTx-TEG-Info-r17 NR-UE-RxTx-TEG-Info-r17 OPTIONAL,

nr-DL-PRS-FirstPathRSRP-ResultDiff-r17 INTEGER (0..61) OPTIONAL,

nr-los-nlos-IndicatorPerResource-r17 LOS-NLOS-Indicator-r17 OPTIONAL,

nr-AdditionalPathListExt-r17 NR-AdditionalPathListExt-r17 OPTIONAL

]],

[[

nr-UE-RxTxTimeDiff-BasedOnAggregatedResources-r18 BOOLEAN OPTIONAL,

nr-Aggregated-DL-PRS-ResourceSetIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourceSetsPerTRP-r18)) OF NR-DL-PRS-ResourceSetID-r16 OPTIONAL,

nr-Aggregated-DL-PRS-ResourceIDList-r18 SEQUENCE (SIZE (1.. nrMaxNumAggregatedDL-PRS-ResourcesPerResourceSet-r18)) OF NR-DL-PRS-ResourceID-r16 OPTIONAL

]]

}

NR-SRS-TxTEG-Element-r17 ::= SEQUENCE {

nr-TimeStamp-r17 NR-TimeStamp-r16 OPTIONAL, -- Need OP

nr-UE-Tx-TEG-ID-r17 INTEGER (0..maxNumOfTxTEGs-1-r17),

carrierFreq-r17 SEQUENCE {

absoluteFrequencyPointA-r17 ARFCN-ValueNR-r15,

offsetToPointA-r17 INTEGER (0..2199)

} OPTIONAL,

srs-PosResourceList-r17 SEQUENCE (SIZE (1..maxNumOfSRS-PosResources-r17)) OF

INTEGER (0..maxNumOfSRS-PosResources-1-r17),

...

}

NR-UE-RxTx-TEG-Info-r17 ::= CHOICE {

case1-r17 SEQUENCE {

nr-UE-RxTx-TEG-ID-r17 INTEGER (0..maxNumOfRxTxTEGs-1-r17)

},

case2-r17 SEQUENCE {

nr-UE-RxTx-TEG-ID-r17 INTEGER (0..maxNumOfRxTxTEGs-1-r17),

nr-UE-Tx-TEG-Index-r17 INTEGER (1..maxTxTEG-Sets-r17)

},

case3-r17 SEQUENCE {

nr-UE-Rx-TEG-ID-r17 INTEGER (0..maxNumOfRxTEGs-1-r17),

nr-UE-Tx-TEG-Index-r17 INTEGER (1..maxTxTEG-Sets-r17)

},

...

}

-- ASN1STOP

| Conditional presence | Explanation |
| --- | --- |
| *Case2-3* | The field is mandatory present if the IE *NR-UE-RxTx-TEG-Info* is provided for choice's *case2* and *case3*. Otherwise it is not present. |
| *TEGCase3* | The field is optionally present, need OP, if the IE *NR-UE-RxTx-TEG-Info* is provided for choice *case3*. Otherwise it is not present. |
| *TEGCase2-3* | The field is optionally present, need OP, if the IE *NR-UE-RxTx-TEG-Info* is provided for choice's *case2* and *case3*. Otherwise it is not present. |
| *TEGCase1-2* | The field is optionally present, need OP, if the IE *NR-UE-RxTx-TEG-Info* is provided for choice's *case1* and *case2*. Otherwise it is not present. |

|  |
| --- |
| *NR-Multi-RTT-SignalMeasurementInformation* field descriptions |
| ***nr-NTA-Offset***  This field provides the *NTAoffset* used by the target device as specified in TS 38.133 [46], Table 7.1.2-2. Enumerated values nTA1, nTA2, nTA3, and nTA4 correspond to *NTAoffset* of 25600 Tc, 0 Tc, 39936 Tc, and 13792 Tc, respectively. |
| ***nr-SRS-TxTEG-Set***  This field provides the SRS for Positioning Resources associated with a particular UE Tx TEG and comprises the following subfields:  - ***nr-TimeStamp*** specifies the start time for which the *NR-SRS-TxTEG-Element* is valid. If this field is absent, the *nr-TimeStamp* of this instance of the *NR-SRS-TxTEG-Element* of the *nr-SRS-TxTEG-Set* is the same as the *nr-TimeStamp* of the previous instance of the *NR-SRS-TxTEG-Element*. If this field is also absent in the first *NR-SRS-TxTEG-Element* of the *nr-SRS-TxTEG-Set*, all *NR-SRS-TxTEG-Element*'s provided are valid for the measurement period of the *NR-Multi-RTT-SignalMeasurementInformation.*  - ***nr-UE-Tx-TEG-ID*** specifies the ID of this UE Tx TEG.  - ***carrierFreq*** specifies the frequency of the SRS for positioning resources.  - ***srs-PosResourceList*** specifies the SRS for Positioning Resources belonging to this UE Tx TEG.  For each UE Tx TEG, there may be up to 8 changes (different *nr-TimeStamp*) of the TEG-SRS association information provided in *nr-SRS-TxTEG-Set*, i.e., the maximum value for *maxTxTEG-Sets* is 64. |
| ***nr-UE-RxTEG-TimingErrorMargin***  This field specifies the UE Rx TEG timing error margin value for all the UE Rx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*. If the IE *NR-UE-RxTx-TEG-Info* is present with choice *case3* and this field is absent, the receiver should consider the UE Rx TEG timing error margin value to be the maximum value available in IE *TEG-TimingErrorMargin*. |
| ***nr-UE-TxTEG-TimingErrorMargin***  This field specifies the UE Tx TEG timing error margin value for all the UE Tx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*. If the IE *NR-UE-RxTx-TEG-Info* is present with choice *case2* or *case3* and this field is absent, the receiver should consider the UE Tx TEG timing error margin value to be the maximum value available in IE *TEG-TimingErrorMargin*. |
| ***nr-UE-RxTxTEG-TimingErrorMargin***  This field specifies the UE RxTx TEG timing error margin value for all the UE RxTx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*. If the IE *NR-UE-RxTx-TEG-Info* is present with choice *case1* or *case2* and this field is absent, the receiver should consider the UE RxTx TEG timing error margin value to be the maximum applicable value as defined in TS 38.133 [46]. |
| ***dl-PRS-ID***  This field is used along with a DL-PRS Resource Set ID and a DL-PRS Resources ID to uniquely identify a DL-PRS Resource. This ID can be associated with multiple DL-PRS Resource Sets associated with a single TRP.  Each TRP should only be associated with one such ID. |
| ***nr-PhysCellID***  This field specifies the physical cell identity of the associated TRP, as defined in TS 38.331 [35]. |
| ***nr-CellGlobalID***  This field specifies the NCGI, the globally unique identity of a cell in NR, of the associated TRP, as defined in TS 38.331 [35]. |
| ***nr-ARFCN***  This field specifies the NR-ARFCN of the TRP's CD-SSB (as defined in TS 38.300 [47]) corresponding to *nr-PhysCellID*. |
| ***nr-UE-RxTxTimeDiff***  This field specifies the UE Rx–Tx time difference measurement, as defined in TS 38.215 [36]. |
| ***nr-AdditionalPathList***  This field specifies one or more additional detected path timing values for the TRP or resource, relative to the path timing used for determining the *nr-UE-RxTxTimeDiff* value. If this field was requested but is not included, it means the UE did not detect any additional path timing values. If this field is present, the field *nr-AdditionalPathListExt* shall be absent. |
| ***nr-TimeStamp***  This field specifies the time instance for which the measurement is performed. |
| ***nr-TimingQuality***  This field specifies the target device′s best estimate of the quality of the measurement. |
| ***nr-DL-PRS-RSRP-Result***  This field specifies the NR DL-PRS reference signal received power (DL PRS-RSRP) measurement, as defined in TS 38.215 [36]. The mapping of the quantity is defined as in TS 38.133 [46]. |
| ***nr-Aggregated-DL-PRS-ResourceSetIDList***  This field provides the PRS resource set IDs for the aggregated measurement which are used for RSRP/RSRPP and/or timing measurement results. The list has the same number of entries of the *nr-aggregated-DL-PRS-ResourceIDList*. |
| ***nr-Aggregated-DL-PRS-ResourceIDList***  This field provides the PRS resource IDs for the aggregated measurement which are used for RSRP/RSRPP and/or timing measurement results. The list has the same number of entries of the *nr-aggregated-DL-PRS-ResourceSetIDList*, and the the resource ID belongs to the resource set in the same position of the list *nr-aggregated-DL-PRS-ResourceSetIDList*. |
| ***nr-UE-RxTxTimeDiff-BasedOnAggregatedResources***  This field indicates whether the measurement is based on aggregation across PFLs for Multi-RTT. |
| ***nr-Multi-RTT-AdditionalMeasurements***  This field provides up to 3 additional UE Rx-Tx time difference measurements corresponding to a single configured SRS Resource or Resource Set for positioning. Each measurement corresponds to a single received DL-PRS Resource or DL-PRS Resource Set [45].  If this field is present, the field *nr-Multi-RTT-AdditionalMeasurementsExt* shall be absent. |
| ***nr-UE-RxTx-TEG-Info***  This field provides the ID(s) of the UE TEG associated with the *nr-UE-RxTxTimeDiff* or*nr-UE-RxTxTimeDiffAdditional* measurement. One of the following combinations of TEG IDs can be provided:  - ***case1*** provides the UE RxTx TEG ID;  - ***case2*** provides the UE RxTx TEG ID together with the UE Tx TEG ID. The *nr-UE-Tx-TEG-Index* provides the index to the *nr-SRS-TxTEG-Set* field for the applicable UE Tx TEG ID, where value '1' indicates the first *NR-SRS-TxTEG-Element* in *nr-SRS-TxTEG-Set*, value '2' indicates the second *NR-SRS-TxTEG-Element* in *nr-SRS-TxTEG-Set*, and so on;  - ***case3*** provides the UE Rx TEG ID together with the UE Tx TEG ID. The *nr-UE-Tx-TEG-Index* provides the index to the *nr-SRS-TxTEG-Set* field for the applicable UE Tx TEG ID, where value '1' indicates the first *NR-SRS-TxTEG-Element* in *nr-SRS-TxTEG-Set*, value '2' indicates the second *NR-SRS-TxTEG-Element* in *nr-SRS-TxTEG-Set*, and so on. |
| ***nr-DL-PRS-FirstPathRSRP-Result***  This field specifies the NR DL PRS reference signal received path power (DL PRS-RSRPP) of the first detected path in time, as defined in TS 38.215 [36]. The mapping of the measured quantity is defined as in TS 38.133 [46]. |
| ***nr-los-nlos-Indicator***  This field specifies the target device's best estimate of the LOS or NLOS of the UE Rx-Tx Time Difference, RSRP or RSRPP of first path measurement for the TRP or resource.  NOTE: If the requested type or granularity in *nr-los-nlos-IndicatorRequest* is not possible, the target device may provide a different type and granularity for the estimated *LOS-NLOS-Indicator.* |
| ***nr-AdditionalPathListExt***  This field provides up to 8 additional detected path timing values for the TRP or resource, relative to the path timing used for determining the *nr-UE-RxTxTimeDiff* value. If this field was requested but is not included, it means the UE did not detect any additional path timing values. If this field is present, the field *nr-AdditionalPathList* shall be absent. |
| ***nr-Multi-RTT-AdditionalMeasurementsExt***  This field, in addition to the measurements provided in *NR-Multi-RTT-MeasElement*, provides UE Rx-Tx time difference measurements of up to 4 DL-PRS Resources of a TRP with different UE RxTx or UE Rx TEGs. For a certain DL-PRS Resource, there can be up to 8 measurement results with respect to different UE RxTx or UE Rx TEGs. If this field is present, the field *nr-Multi-RTT-AdditionalMeasurements* shall be absent. |
| ***nr-DL-PRS-RSRP-ResultDiff***  This field provides the additional DL-PRS RSRP measurement result relative to *nr-DL-PRS-RSRP-Result.* The DL-PRS RSRP value of this measurement is obtained by adding the value of this field to the value of the *nr-DL-PRS-RSRP-Result*. The mapping of this field is defined as in TS 38.133 [46]. |
| ***nr-UE-RxTxTimeDiffAdditional***  This field provides the additional UE Rx-Tx Difference measurement result relative to *nr-UE-RxTxTimeDiff.* The UE Rx-Tx Difference value of this measurement is obtained by adding the value of this field to the value of the *nr-UE-RxTxTimeDiff* field. The mapping of the field is defined in TS 38.133 [46]. |
| ***nr-DL-PRS-FirstPathRSRP-ResultDiff***  This field specifies the additional NR DL-PRS reference signal received path power (DL PRS-RSRPP) of the first detected path in time relative to *nr-DL-PRS-FirstPathRSRP-Result*. The DL-PRS RSRPP of first path value of this measurement is obtained by adding the value of this field to the value of the *nr-DL-PRS-FirstPathRSRP-Result* field. The mapping of the field is defined in TS 38.133 [46]. |
| ***nr-los-nlos-IndicatorPerResource***  This field specifies the target device's best estimate of the LOS or NLOS of the UE Rx-Tx Time Difference, RSRP or RSRPP of first path measurement for the resource.  This field may only be present if the field *nr-LOS-NLOS-Indicator* choice indicates *perResource*. |

*NEXT CHANGE*

6.5.12.5 NR Multi-RTT Location Information Request

– *NR-Multi-RTT-RequestLocationInformation*

The IE *NR-Multi-RTT-RequestLocationInformation* is used by the location server to request NR Multi-RTT location measurements from a target device.

-- ASN1START

NR-Multi-RTT-RequestLocationInformation-r16 ::= SEQUENCE {

nr-UE-RxTxTimeDiffMeasurementInfoRequest-r16

ENUMERATED { true } OPTIONAL, -- Need ON

nr-RequestedMeasurements-r16 BIT STRING { prsrsrpReq (0),

firstPathRsrpReq-r17 (1),

jointMeasurementsReq-r18 (2)} (SIZE(1..8)),

nr-AssistanceAvailability-r16 BOOLEAN,

nr-Multi-RTT-ReportConfig-r16 NR-Multi-RTT-ReportConfig-r16,

additionalPaths-r16 ENUMERATED { requested } OPTIONAL, -- Need ON

...,

[[

nr-UE-RxTxTEG-Request-r17 ENUMERATED { case1, case2, case3, ... }

OPTIONAL, -- Need ON

measureSameDL-PRS-ResourceWithDifferentRxTxTEGs-r17

ENUMERATED { n0, n2, n3, n4, n6, n8, ... }

OPTIONAL, -- Need ON

measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17

ENUMERATED { n0, n2, n3, n4, n6, n8, ... }

OPTIONAL, -- Need ON

reducedDL-PRS-ProcessingSamples-r17

ENUMERATED { requested, ... } OPTIONAL, -- Need ON

nr-los-nlos-IndicatorRequest-r17 SEQUENCE {

type-r17 LOS-NLOS-IndicatorType1-r17,

granularity-r17 LOS-NLOS-IndicatorGranularity1-r17,

...

} OPTIONAL, -- Need ON

additionalPathsExt-r17 ENUMERATED { requested } OPTIONAL, -- Need ON

additionalPathsDL-PRS-RSRP-Request-r17

ENUMERATED { requested } OPTIONAL, -- Need ON

multiMeasInSameReport-r17 ENUMERATED { requested } OPTIONAL, -- Need ON

lowerRxBeamSweepingFactor-FR2-r17 ENUMERATED { requested } OPTIONAL -- Need ON

]],

[[

nr-Multi-RTT-ReportConfig-Ext-r18 NR-Multi-RTT-ReportConfig-Ext-r18 OPTIONAL, -- Need ON

nr-DL-PRS-JointMeasurementRequested-r18 INTEGER (1..nrMaxNumPRSBandWidthAggregation-r18)

OPTIONAL -- Need ON

]]

}

NR-Multi-RTT-ReportConfig-r16 ::= SEQUENCE {

maxDL-PRS-RxTxTimeDiffMeasPerTRP-r16 INTEGER (1..4) OPTIONAL, -- Need ON

timingReportingGranularityFactor-r16 INTEGER (0..5) OPTIONAL -- Need ON

}

NR-Multi-RTT-ReportConfig-Ext-r18 ::= SEQUENCE {

timingReportingGranularityFactor-Ext-r18 INTEGER (6..7) OPTIONAL -- Need ON

}

-- ASN1STOP

|  |
| --- |
| ***NR-Multi-RTT-RequestLocationInformation* field descriptions** |
| ***nr-UE-RxTxTimeDiffMeasurementInfoRequest***  This field, if present, indicates that the target device is requested to report the DL-PRS Resource ID(s) or DL-PRS Resource Set ID(s) associated with the DL-PRS Resources(s) or the DL-PRS Resource Set(s) which are used in determining the UE Rx-Tx time difference measurements. |
| ***nr-AssistanceAvailability***  This field indicates whether the target device may request additional PRS assistance data from the server. TRUE means allowed and FALSE means not allowed. |
| ***maxDL-PRS-RxTxTimeDiffMeasPerTRP***  This field specifies the maximum number of UE-Rx-Tx time difference measurements for different DL-PRS Resources or DL-PRS Resource Sets per TRP. |
| ***timingReportingGranularityFactor, timingReportingGranularityFactor-Ext***  This field specifies the recommended reporting granularity for the UE Rx-Tx time difference measurements. Value (0..5) corresponds to (*k0*..*k5*) and value (6..7) corresponds to (k-1..k-2) used for *nr-UE-RxTxTimeDiff* and *nr-UE-RxTxTimeDiffAdditional* in *NR-Multi-RTT-MeasElement*. The UE may select a different granularity value for *nr-UE-RxTxTimeDiff* and *nr-UE-RxTxTimeDiffAdditional*. |
| ***additionalPaths***  This field, if present, indicates that the target device is requested to provide the *nr-AdditionalPathList* in IE *NR-Multi-RTT-SignalMeasurementInformation*. If this field is present, the field *additionalPathsExt* shall be absent. |
| ***nr-UE-RxTxTEG-Request***  This field, if present, indicates that the target device is requested to provide the *NR-UE-RxTx-TEG-Info* in IE *NR-Multi-RTT-SignalMeasurementInformation.* Enumerated value '*case1*' indicates that the target device is requested to provide the *case1* choice in *NR-UE-RxTx-TEG-Info*, enumerated value '*case2*' indicates that the target device is requested to provide the *case2* choice in *NR-UE-RxTx-TEG-Info*, and so on. |
| ***measureSameDL-PRS-ResourceWithDifferentRxTxTEGs***  This field, if present, indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with *N* different UE RxTx TEGs and with the same UE Tx TEG. Enumerated value '*n0*' indicates that the number *N* of different UE RxTx TEGs to measure the same DL PRS Resource can be determined by the target device, value '*n2*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 2 different UE RxTx TEGs, value '*n3*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 3 different UE RxTx TEGs, and so on.  If this field is present, the field *nr-UE-RxTxTEG-Request* should also be present.  If this field is present, the field *measureSameDL-PRS-ResourceWithDifferentRxTEGs* should not be present. |
| ***measureSameDL-PRS-ResourceWithDifferentRxTEGs***  This field, if present, indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with *N* different UE Rx TEGs. Enumerated value '*n0*' indicates that the number *N* of different UE Rx TEGs to measure the same DL PRS Resource can be determined by the target device, value '*n2*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 2 different UE Rx TEGs, value '*n3*' indicates that the target device is requested to measure the same DL-PRS Resource of a TRP with 3 different UE Rx TEGs, and so on.  If this field is present, the field *nr-UE-RxTxTEG-Request* should also be present.  If this field is present, the field *measureSameDL-PRS-ResourceWithDifferentRxTxTEGs* should not be present. |
| ***nr-DL-PRS-JointMeasurementRequested***  This field indicates which two or three PFLs and the DL PRS resource sets in the two or three DL PFLs that are linked for DL PRS BW aggregation for the joint measurements. |
| ***reducedDL-PRS-ProcessingSamples***  This field, if present and set to '*requested*', indicates that the target device is requested to perform the requested measurements with reduced number of samples (M=1 or M=2) as specified in TS 38.133 [46]. |
| ***nr-los-nlos-IndicatorRequest***  This field, if present, indicates that the target device is requested to provide the indicated type and granularity of the estimated *LOS-NLOS-Indicator* in the *NR-Multi-RTT-SignalMeasurementInformation*. |
| ***additionalPathsExt***  This field, if present, indicates that the target device is requested to provide the *nr-AdditionalPathListExt* in IE *NR-Multi-RTT-SignalMeasurementInformation*. If this field is present, the field *additionalPaths* shall be absent. |
| ***additionalPathsDL-PRS-RSRP-Request***  This field, if present, indicates that the target device is requested to provide the *nr-DL-PRS-RSRPP* for the additional paths in the field *nr-AdditionalPathList* or *nr-AdditionalPathListExt*. |
| ***multiMeasInSameReport***  This field, if present, indicates that the target device is requested to provide multiple measurement instances in a single measurement report; i.e., include the *nr-Multi-RTT-SignalMeasurementInstances* in IE *NR-Multi-RTT-ProvideLocationInformation.* |
| ***lowerRxBeamSweepingFactor-FR2***  This field, if present, indicates that the target device is requested to use a lower Rx beam sweeping factor than 8 for FR2 according to UE's capability. |

*NEXT CHANGE*

6.5.12.6 NR Multi-RTT Capability Information

– *NR-Multi-RTT-ProvideCapabilities*

The IE *NR-Multi-RTT-ProvideCapabilities* is used by the target device to indicate its capability to support NR Multi-RTT and to provide its NR Multi-RTT positioning capabilities to the location server.

-- ASN1START

NR-Multi-RTT-ProvideCapabilities-r16 ::= SEQUENCE {

nr-Multi-RTT-PRS-Capability-r16 NR-DL-PRS-ResourcesCapability-r16,

nr-Multi-RTT-MeasurementCapability-r16 NR-Multi-RTT-MeasurementCapability-r16,

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

nr-DL-PRS-ProcessingCapability-r16 NR-DL-PRS-ProcessingCapability-r16,

nr-UL-SRS-Capability-r16 NR-UL-SRS-Capability-r16,

additionalPathsReport-r16 ENUMERATED { supported } OPTIONAL,

periodicalReporting-r16 ENUMERATED { supported } OPTIONAL,

...,

[[

ten-ms-unit-ResponseTime-r17 ENUMERATED { supported } OPTIONAL,

nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r17 BIT STRING { eAoD (0),

eAoA (1)

} (SIZE (1..8)) OPTIONAL, nr-Multi-RTT-On-Demand-DL-PRS-Support-r17

NR-On-Demand-DL-PRS-Support-r17 OPTIONAL,

nr-UE-RxTx-TEG-ID-ReportingSupport-r17 BIT STRING { case1 (0),

case2 (1),

case3 (2)

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

nr-los-nlos-IndicatorSupport-r17 SEQUENCE {

type-r17 LOS-NLOS-IndicatorType2-r17,

granularity-r17 LOS-NLOS-IndicatorGranularity2-r17,

...

} OPTIONAL,

additionalPathsExtSupport-r17 ENUMERATED { n4, n6, n8 } OPTIONAL,

scheduledLocationRequestSupported-r17 ScheduledLocationTimeSupport-r17 OPTIONAL,

nr-dl-prs-AssistanceDataValidity-r17 SEQUENCE {

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

...

} OPTIONAL,

multiMeasInSameMeasReport-r17 ENUMERATED { supported } OPTIONAL,

mg-ActivationRequest-r17 ENUMERATED { supported } OPTIONAL

]],

[[

posMeasGapSupport-r17 ENUMERATED { supported } OPTIONAL

]],

[[

finerReportingGranularitySupport-r18 ENUMERATED { supported } OPTIONAL

]]

}

-- ASN1STOP

| ***NR-Multi-RTT-ProvideCapabilities* field descriptions** |
| --- |
| ***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*. |
| ***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-Multi-RTT-On-Demand-DL-PRS-Support***  This field, if present, indicates that the target device supports on-demand DL-PRS requests. |
| ***nr-UE-RxTx-TEG-ID-ReportingSupport***  This field, if present, indicates that the target device supports *nr-UE-RxTx-TEG-Info* reporting in IE *NR-Multi-RTT-SignalMeasurementInformation.* This is represented by a bit string, with a one‑value at the bit position means the particular case is supported; a zero‑value means not supported:  - bit 0indicates that the target device supports the '*case1*' choice in *NR-UE-RxTx-TEG-Info*.  - bit 1 indicates that the target device supports the '*case2*' choice in *NR-UE-RxTx-TEG-Info*.  - bit 2 indicates that the target device supports the '*case3*' choice in *NR-UE-RxTx-TEG-Info*. |
| ***nr-los-nlos-IndicatorSupport***  This field, if present, indicates that the target device supports *nr-los-nlos-Indicator* reporting in IE *NR-Multi-RTT-SignalMeasurementInformation*.  - *type* indicates whether the target device supports '*hard*' value or '*hard*' and '*soft*' value in IE *LOS-NLOS-Indicator.*  - *granularity* indicates whether the target device supports *LOS-NLOS-Indicator* reporting per TRP, per DL-PRS Resource, or both.  NOTE: A single value is reported when both Multi-RTT and DL-TDOA are supported. |
| ***additionalPathsExtSupport***  This field, if present, indicates that the target device supports the *nr-AdditionalPathListExt* reporting in IE *NR-Multi-RTT-SignalMeasurementInformation*. The enumerated value indicates the number of additional paths supported by the target device.  NOTE: The *supportOfDL-PRS-FirstPathRSRP* in IE *NR-Multi-RTT-MeasurementCapability* also applies to the additional paths. |
| ***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-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*.* |
| ***multiMeasInSameMeasReport***  This field, if present, indicates that the target device supports multiple measurement instances in a single measurement report. |
| ***mg-ActivationRequest***  This field, if present, indicates that the target device supports UL MAC CE for positioning measurement gap activation/deactivation request for DL-PRS measurements. The UE can include this field only if the UE supports *mg-ActivationRequestPRS-Meas* and *mg-ActivationCommPRS-Meas* defined in TS 38.331 [35]. |
| ***posMeasGapSupport***  This field, if present, indicates that the target device supports pre-configured positioning measurement gap for DL-PRS measurements. The UE can include this field only if the UE supports *mg-ActivationCommPRS-Meas* defined in TS 38.331 [35]. |
| ***finerReportingGranularitySupport***  This field, if present, indicates that the target device supports finer measurement reporting granularity for UE Rx-Tx measurement for k-1 and k-2 as in clause 6.5.12.4. |

*NEXT CHANGE*

## 6.6 Multiplicity and type constraint values

#### *– Multiplicity and type constraint definitions*

-- ASN1START

maxEARFCN INTEGER ::= 65535 -- Maximum value of EUTRA carrier frequency

maxEARFCN-Plus1 INTEGER ::= 65536 -- Lowest value extended EARFCN range

maxEARFCN2 INTEGER ::= 262143 -- Highest value extended EARFCN range

maxMBS-r14 INTEGER ::= 64

maxWLAN-AP-r13 INTEGER ::= 64

maxKnownAPs-r14 INTEGER ::= 2048

maxVisibleAPs-r14 INTEGER ::= 32

maxWLAN-AP-r14 INTEGER ::= 128

maxWLAN-DataSets-r14 INTEGER ::= 8

maxBT-Beacon-r13 INTEGER ::= 32

nrMaxBands-r16 INTEGER ::= 1024 -- Maximum number of supported bands in

-- UE capability.

nrMaxFreqLayers-r16 INTEGER ::= 4 -- Max freq layers

nrMaxFreqLayers-1-r16 INTEGER ::= 3

nrMaxNumDL-PRS-ResourcesPerSet-1-r16 INTEGER ::= 63

nrMaxNumDL-PRS-ResourceSetsPerTRP-1-r16 INTEGER ::= 7

nrMaxResourceIDs-r16 INTEGER ::= 64 -- Max Resource IDs

nrMaxResourceOffsetValue-1-r16 INTEGER ::= 511

nrMaxResourcesPerSet-r16 INTEGER ::= 64 -- Maximum resources for one set

nrMaxSetsPerTrpPerFreqLayer-r16 INTEGER ::= 2 -- Maximum resource sets for one TRP

nrMaxSetsPerTrpPerFreqLayer-1-r16 INTEGER ::= 1

nrMaxTRPs-r16 INTEGER ::= 256 -- Max TRPs per UE

nrMaxTRPsPerFreq-r16 INTEGER ::= 64 -- Max TRPs per freq layers

nrMaxTRPsPerFreq-1-r16 INTEGER ::= 63

maxSimultaneousBands-r16 INTEGER ::= 4 -- Maximum number of simultaneously

-- measured bands

maxBandComb-r16 INTEGER ::= 1024

nrMaxConfiguredBands-r16 INTEGER ::= 16

maxNumOfRxTEGs-r17 INTEGER ::= 32

maxNumOfRxTEGs-1-r17 INTEGER ::= 31

maxNumOfTxTEGs-1-r17 INTEGER ::= 7

maxTxTEG-Sets-r17 INTEGER ::= 256 -- Maximum applicable number is 64

maxNumOfRxTxTEGs-1-r17 INTEGER ::= 255

maxNumOfTRP-TxTEGs-1-r17 INTEGER ::= 7

maxNumOfSRS-PosResources-r17 INTEGER ::= 64

maxNumOfSRS-PosResources-1-r17 INTEGER ::= 63

maxNumResourcesPerAngle-r17 INTEGER ::= 24

maxNumPrioResources-r17 INTEGER ::= 24

maxAddMeasTDOA-r17 INTEGER ::= 31

maxAddMeasAoD-r17 INTEGER ::= 23

maxAddMeasRTT-r17 INTEGER ::= 31

maxOD-DL-PRS-Configs-r17 INTEGER ::= 8

maxCellIDsPerArea-r17 INTEGER ::= 256

maxNrOfAreas-r17 INTEGER ::= 16

maxMeasInstances-r17 INTEGER ::= 32

nrMaxNumPRSBandWidthAggregation-r18 INTEGER ::= 7 -- Max number of PRS bandwidth aggregation configurations that LMF can provide to the UE

nrMaxNumAggregatedDL-PRS-ResourceSetsPerTRP-r18 INTEGER ::= 2 -- Max number of aggregated ResourceSets

nrMaxNumAggregatedDL-PRS-ResourcesPerResourceSet-r18 INTEGER ::= 64 -- Max number of aggregated Resources

Editor notes: FFS the maximum number of PRS bandwidth aggregation configurations that LMF can provide to UE, and the number of resources in measurement report.

-- ASN1STOP

*END OF CHANGE*