**3GPP TSG-RAN2 Meeting #125 *R2-240xxxx***

**, Greece, 26th Feb- 1st Mar, 2024**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.355** | **CR** |  | **rev** | **-** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Correction to per error source integrity parameters | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2-Core | | | | |  | ***Date:*** | | | 2024-02-26 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

============================CHANGE BEGINS==========================================

#### *– NR-PositionCalculationAssistance*

The IE *NR-PositionCalculationAssistance* is used by the location server to provide assistance data 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-TRP-LocationInfo-v18xy NR-TRP-LocationInfo-v18xy OPTIONAL, -- Cond Integrity1

nr-DL-PRS-BeamInfo-v18xy NR-DL-PRS-BeamInfo-v18xy OPTIONAL, -- Cond Integrity2

nr-RTD-Info-v18xy NR-RTD-Info-v18xy OPTIONAL, -- Cond Integrity3

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

]]

}

-- ASN1STOP

| Conditional presence | Explanation |
| --- | --- |
| *Integrity1* | The field is optionally present, need OR, if *NR-TRP-LocationInfo* is present and *integrityReferencePointLocationBounds*, *IntegrityLocationBounds* 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 *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 *IntegrityRTD-InfoBounds* is present in IE *NR-RTD-Info;* 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 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. |
| ***rtd-ErrorCorrelationTime***  This field specifies 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 measurement reported by a PRU to the target UE. |

================================NEXT CHANGE========================================

#### *–* *NR-TRP-LocationInfo*

The IE *NR-TRP-LocationInfo* is used by the location server to provide the coordinates of TRPs and coordinates of the antenna reference points for a set of TRPs. For each TRP, the ARP location can be provided for each associated PRS Resource ID per PRS Resource Set.

-- ASN1START

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

NR-TRP-LocationInfoPerFreqLayer-r16

NR-TRP-LocationInfoPerFreqLayer-r16 ::= SEQUENCE {

referencePoint-r16 ReferencePoint-r16 OPTIONAL, -- Cond NotSameAsPrev

trp-LocationInfoList-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF

TRP-LocationInfoElement-r16,

...

}

TRP-LocationInfoElement-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

associated-DL-PRS-ID-r16 INTEGER (0..255) OPTIONAL, -- Need OP

trp-Location-r16 RelativeLocation-r16 OPTIONAL, -- Need OP

trp-DL-PRS-ResourceSets-r16 SEQUENCE (SIZE(1..nrMaxSetsPerTrpPerFreqLayer-r16)) OF

DL-PRS-ResourceSets-TRP-Element-r16 OPTIONAL, -- Need OP

...,

[[

trp-LocationCartesian-r18 RelativeCartesianLocation-r18 OPTIONAL, -- Need OP

integrityTRP-LocationBounds-r18 IntegrityLocationBounds-r18 OPTIONAL -- Need OR

]]

}

DL-PRS-ResourceSets-TRP-Element-r16 ::= SEQUENCE {

dl-PRS-ResourceSetARP-r16 RelativeLocation-r16 OPTIONAL, -- Need OP

dl-PRS-Resource-ARP-List-r16 SEQUENCE (SIZE(1..nrMaxResourcesPerSet-r16)) OF

DL-PRS-Resource-ARP-Element-r16 OPTIONAL, -- Need OP

...,

[[

dl-PRS-ResourceSetARP-Cartesian-r18 RelativeCartesianLocation-r18 OPTIONAL, -- Need OP

integrityDL-PRS-ResourceSetARP-LocationBounds-r18

IntegrityLocationBounds-r18 OPTIONAL -- Need OR

]]

}

DL-PRS-Resource-ARP-Element-r16 ::= SEQUENCE {

dl-PRS-Resource-ARP-location-r16 RelativeLocation-r16 OPTIONAL, -- Need OP

...,

[[

dl-PRS-Resource-ARP-locationCartesian-r18

RelativeCartesianLocation-r18 OPTIONAL, -- Need OP

integrityDL-PRS-ResourceARP-LocationBounds-r18

IntegrityLocationBounds-r18 OPTIONAL -- Need OR

]]

}

IntegrityLocationBounds-r18 ::= SEQUENCE {

meanLatitude-r18 INTEGER (0..255),

meanLongitude-r18 INTEGER (0..255),

meanheight-r18 INTEGER (0..255),

stdDevLatitude-r18 INTEGER (0..255),

stdDevLongitude-r18 INTEGER (0..255),

stdDevheight-r18 INTEGER (0..255),

...

}

NR-TRP-LocationInfo-v18xy ::= SEQUENCE {

nr-IntegrityParametersTRP-LocationInfo-r18 NR-IntegrityParametersTRP-LocationInfo-r18 OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| Conditional presence | Explanation |
| --- | --- |
| *NotSameAsPrev* | The field is mandatory present in the first entry of the *NR-TRP-LocationInfoPerFreqLayer* in the *NR-TRP-LocationInfo* list; otherwise it is optionally present, need OP. |

| *NR-TRP-LocationInfo* field descriptions |
| --- |
| ***referencePoint***  This field specifies the reference point used to define the location of TRPs provided in the *trp-LocationInfoList*. If this field is absent, the reference point is the same as in the previous entry of the *NR-TRP-LocationInfoPerFreqLayer* in the *NR-TRP-LocationInfo* list. |
| ***trp-LocationInfoList***  This field provides the antenna reference point locations of the DL-PRS Resources for the TRPs and comprises the following sub-fields:  - ***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 to a single TRP.  - ***nr-PhysCellID***: This field specifies the physical cell identity of the associated TRP.  - ***nr-CellGlobalID***: This field specifies the NCGI, the globally unique identity of a cell in NR, of the associated TRP.  - ***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*.  - ***associated-DL-PRS-ID***: This field, if present, specifies the *dl-PRS-ID* of the associated TRP from which the *trp-location* or *trp-LocationCartesian* information is adopted. If the field is present, the field *trp-Location* and *trp-LocationCartesian* shall be absent.  - ***trp-Location, trp-LocationCartesian***: This field provides the location of the TRP relative to the *referencePoint* location either in geodetic coordinates (*trp-Location*)or local Cartesian coordinates (*trp-LocationCartesian*). If this field is absent the TRP location coincides with the *referencePoint* location, unless the field *associated-dl-PRS-ID*is present, in which case the *trp-Location* or *trp-LocationCartesian* is adopted from the associated TRP indicated by *associated-dl-PRS-ID*.  - ***trp-DL-PRS-ResourceSets***: This field provides the antenna reference point location(s) of the DL-PRS Resource Set(s) associated with this TRP. If this field is absent, the antenna reference point location(s) of the DL-PRS Resource Set(s) coincides with the *trp-Location/trp-LocationCartesian* location. This field comprises the following sub-fields:  - ***dl-PRS-ResourceSetARP, dl-PRS-ResourceSetARP-Cartesian***: This field provides the antenna reference point location of the DL-PRS Resource Set relative to the *trp-Location* or *trp-LocationCartesian* location. If this field is absent, the antenna reference point location of this DL-PRS Resource Set coincides with the *trp-Location* or *trp-LocationCartesian* location.  - ***integrityDL-PRS-ResourceSetARP-LocationBounds***: This field specifies the mean and the Standard Deviation location error bound for an overbounding model that bounds the antenna reference point location error of the DL-PRS Resource Set.  - ***dl-PRS-Resource-ARP-List***: This field provides the antenna reference point location(s) of the DL-PRS Resource(s) associated with this Resource Set of the TRP. If this field is absent, the antenna reference point location(s) of the DL-PRS Resources coincides with the *dl-PRS-ResourceSetARP* location or *dl-PRS-ResourceSetARP-Cartesian*. This field comprises the following sub-fields:  - ***dl-PRS-Resource-ARP-location, dl-PRS-Resource-ARP-locationCartesian***: This field provides the antenna reference point location of the DL-PRS Resource associated with the DL-PRS Resource Set of the TRP relative to the *dl-PRS-ResourceSetARP/dl-PRS-ResourceSetARP-Cartesian* location. If this field is absent, the antenna reference point location of this DL-PRS Resource coincides with the *dl-PRS-ResourceSetARP* location or *dl-PRS-Resource-ARP-locationCartesian*.  - ***integrityDL-PRS-ResourceARP-LocationBounds***: This field specifies the mean and the Standard Deviation location error bound for an overbounding model that bounds the antenna reference point location error of the DL-PRS Resource associated with the DL-PRS Resource Set of the TRP.  - ***integrityTRP-LocationBounds***: This field specifies the mean and the Standard Deviation TRP location error bound for an overbounding model that bounds the TRP location error. |
| ***IntegrityLocationBounds***  This field specifies the mean and the standard deviation of the location error bound of the overbounding model that bounds the location error, and comprises the following sub-fields:  ***- meanLatitude, meanLongitude, meanheight***: This field specifies the location error bound in Latitude, Longitude, height, which are the mean value for an overbounding model that bounds the corresponding Latitude, Longitude, height error of the referece point locaiton. The bound is mean + K \* stdDev and shall be so that the probability of it to be exceeded shall be lower than IRallocation for *ir-Minimum* < IRallocation < *ir-Maximum*, where K = normInv(IRallocation / 2) and *ir-Minimum*, *ir-Maximum* as provided in IE *NR-Integrity-ServiceParameters*.This IRallocation is a fraction of the Target Integrity Risk that represents the integrity risk budget available. Scale factor 0.1 degrees; range 0-25.5 degrees.  ***- stdDevLatitude, stdDevLongitude, stdDevheight***:This field specifies the Standard Deviation Location Error bound in Latitude, Longitude, height, which are the standard deviation values for the overbounding model that bounds the location of the reference point error in Latitude, Longitude, height. Scale factor 0.1 degrees; range 0-25.5 degrees.  If integrity bounds are provided, the field shall be present at least in the first entry of the *NR-TRP-LocationInfoPerFreqLayer* list. |

NOTE 5: The locations may be provided in either geodetic coordinates (*RelativeLocation*) or local Cartesian coordinates (*RelativeCartesianLocation*), but not both.

=================================NEXT CHANGE=======================================

#### – *NR-DL-PRS-BeamInfo*

The IE *NR-DL-PRS-BeamInfo* is used by the location server to provide spatial direction information of the DL-PRS Resources together with integrity information.

-- ASN1START

NR-DL-PRS-BeamInfo-r16 ::= SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF

NR-DL-PRS-BeamInfoPerFreqLayer-r16

NR-DL-PRS-BeamInfoPerFreqLayer-r16 ::= SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF

NR-DL-PRS-BeamInfoPerTRP-r16

NR-DL-PRS-BeamInfoPerTRP-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

associated-DL-PRS-ID-r16 INTEGER (0..255) OPTIONAL, -- Need OP

lcs-GCS-TranslationParameter-r16 LCS-GCS-TranslationParameter-r16

OPTIONAL, -- Need OP

dl-PRS-BeamInfoSet-r16 DL-PRS-BeamInfoSet-r16 OPTIONAL, -- Need OP

...

}

DL-PRS-BeamInfoSet-r16 ::= SEQUENCE (SIZE(1..nrMaxSetsPerTrpPerFreqLayer-r16)) OF

DL-PRS-BeamInfoResourceSet-r16

DL-PRS-BeamInfoResourceSet-r16 ::= SEQUENCE (SIZE(1..nrMaxResourcesPerSet-r16)) OF

DL-PRS-BeamInfoElement-r16

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

dl-PRS-Azimuth-r16 INTEGER (0..359),

dl-PRS-Azimuth-fine-r16 INTEGER (0..9) OPTIONAL, -- Need ON

dl-PRS-Elevation-r16 INTEGER (0..180) OPTIONAL, -- Need ON

dl-PRS-Elevation-fine-r16 INTEGER (0..9) OPTIONAL, -- Need ON

...,

[[

integrityBeamInfoBounds-r18 IntegrityBeamInfoBounds-r18 OPTIONAL -- Need OP

]]

}

IntegrityBeamInfoBounds-r18 ::= SEQUENCE {

meanAzimuth-r18 INTEGER (0..128),

stdDevAzimuth-r18 INTEGER (0..255),

meanElevation-r18 INTEGER (0..128),

stdDevElevation-r18 INTEGER (0..255),

...

}

NR-DL-PRS-BeamInfo-v18xy ::= SEQUENCE {

nr-IntegrityParametersDL-PRS-BeamInfo-r18

NR-IntegrityParametersDL-PRS-BeamInfo-r18 OPTIONAL, -- Need OR

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

OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *NR-DL-PRS-BeamInfo* field descriptions |
| --- |
| ***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]. The server should include this field if it considers that it is needed to resolve ambiguity in the TRP indicated by *nr-PhysCellID*. |
| ***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*. |
| ***associated-DL-PRS-ID***  This field specifies the *dl-PRS-ID* of the associated TRP from which the beam information is obtained. See the field descriptions of *dl-PRS-BeamInfoSet* and *lcs-GCS-TranslationParameter*. |
| ***lcs-GCS-TranslationParameter***  This field provides the angles α (bearing angle), β (downtilt angle) and γ (slant angle) for the translation of a Local Coordinate System (LCS) to a Global Coordinate System (GCS) as defined in TR 38.901 [44]. If this field and the field *associated-DL-PRS-ID* are absent, the *dl-PRS-Azimuth* and *dl-PRS-Elevation* are provided in a GCS. If this field is absent and the *associated-DL-PRS-ID field* is present, then the *lcs-GCS-TranslationParameter* for this TRP is obtained from the *lcs-GCS-TranslationParameter* of the associated TRP. |
| ***dl-PRS-BeamInfoSet***  This field provides the DL-PRS beam information for each DL-PRS Resource of the DL-PRS Resource Set associated with this TRP. If this field is absent and the field *associated-DL-PRS-ID* is present, the *dl-PRS-BeamInfoSet* for this TRP are obtained from the *dl-PRS-BeamInfoSet* of the associated TRP. |
| ***dl-PRS-Azimuth***  This field specifies the azimuth angle of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  For a Global Coordinate System (GCS), the azimuth angle is measured counter-clockwise from geographical North.  For a Local Coordinate System (LCS), the azimuth angle is measured measured counter-clockwise from the x-axis of the LCS.  Scale factor 1 degree; range 0 to 359 degrees. |
| ***dl-PRS-Azimuth-fine***  This field provides finer granularity for the *dl-PRS-Azimuth*.  The total azimuth angle of the boresight direction is given by *dl-PRS-Azimuth* + *dl-PRS-Azimuth-fine.*  Scale factor 0.1 degrees; range 0 to 0.9 degrees. |
| ***dl-PRS-Elevation***  This field specifies the elevation angle of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  For a Global Coordinate System (GCS), the elevation angle is measured relative to zenith and positive to the horizontal direction (elevation 0 deg. points to zenith, 90 deg to the horizon).  For a Local Coordinate System (LCS), the elevation angle is measured relative to the z-axis of the LCS (elevation 0 deg. points to the z-axis, 90 deg to the x-y plane).  Scale factor 1 degree; range 0 to 180 degrees. |
| ***dl-PRS-Elevation-fine***  This field provides finer granularity for the *dl-PRS-Elevation*.  The total elevation angle of the boresight direction is given by *dl-PRS-Elevation* + *dl-PRS-Elevation-fine.*  Scale factor 0.1 degrees; range 0 to 0.9 degrees. |
| ***integrityBeamInfoBounds***  This field provides an overbounding model that bounds the spatial direction information of the DL-PRS Resources. If this field is absent, the *integrityBeamInfoBounds* for this instance of the *DL-PRS-BeamInfoElement* is the same as the *integrityBeamInfoBounds* of the previous instance of the *DL-PRS-BeamInfoElement* in *DL-PRS-BeamInfoResourceSet*. If integrity bounds are provided, this field shall be present at least in the first instance of the *DL-PRS-BeamInfoResourceSet*. |
| ***meanAzimuth***  This field specifies the Mean Azimuth Error bound which is the mean value for an overbounding model that bounds the azimuth angle error of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  The bound is *meanAzimuth* + K \* *stdDevAzimuth* and shall be so that the probability of it to be exceeded shall be lower than IRallocation for *ir-Minimum* < IRallocation < *ir-Maximum*, where K = normInv(IRallocation / 2) and *ir-Minimum*, *ir-Maximum* as provided in IE *NR-Integrity-ServiceParameters*.  This IRallocation is a fraction of the Target Integrity Risk that represents the integrity risk budget available.  Scale factor 0.1 degrees; range 0-12.8 degrees. |
| ***stdDevAzimuth***  This field specifies the Standard Deviation Azimuth Error bound which is the standard deviation for an overbounding model that bounds the Azimuth error of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  Scale factor 0.1 degrees; range 0-25.5 degrees. |
| ***meanElevation***  This field specifies the Mean Elevation Error bound which is the mean value for an overbounding model that bounds the elevation angle error of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  The bound is *meanElevation* + K \* *stdDevElevation* and shall be so that the probability of it to be exceeded shall be lower than IRallocation for *ir-Minimum* < IRallocation < *ir-Maximum*, where K = normInv(IRallocation / 2) and *ir-Minimum*, *ir-Maximum* as provided in IE *NR-Integrity-ServiceParameters*.  This IRallocation is a fraction of the Target Integrity Risk that represents the integrity risk budget available.  Scale factor 0.1 degrees; range 0-12.8 degrees. |
| ***stdDevElevation***  This field specifies the Standard Deviation Elevation Error bound which is the standard deviation for an overbounding model that bounds the Elevation error of the boresight direction in which the DL-PRS Resources associated with this DL-PRS Resource ID in the DL-PRS Resource Set are transmitted.  Scale factor 0.1 degrees; range 0-25.5 degrees. |

==============================NEXT CHANGE==========================================

#### – *NR-RTD-Info*

The IE *NR-RTD-Info* is used by the location server to provide time synchronization information between a reference TRP and a list of neighbour TRPs.

-- ASN1START

NR-RTD-Info-r16 ::= SEQUENCE {

referenceTRP-RTD-Info-r16 ReferenceTRP-RTD-Info-r16,

rtd-InfoList-r16 RTD-InfoList-r16,

...

}

ReferenceTRP-RTD-Info-r16 ::= SEQUENCE {

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

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

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

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

refTime-r16 CHOICE {

systemFrameNumber-r16 BIT STRING (SIZE (10)),

utc-r16 UTCTime,

...

},

rtd-RefQuality-r16 NR-TimingQuality-r16 OPTIONAL, -- Need ON

...

}

RTD-InfoList-r16 ::= SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF RTD-InfoListPerFreqLayer-r16

RTD-InfoListPerFreqLayer-r16 ::= SEQUENCE (SIZE(1..nrMaxTRPsPerFreq-r16)) OF RTD-InfoElement-r16

RTD-InfoElement-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

subframeOffset-r16 INTEGER (0..1966079),

rtd-Quality-r16 NR-TimingQuality-r16,

...,

[[

integrityRTD-InfoBounds-r18 IntegrityRTD-InfoBounds-r18 OPTIONAL -- Need OR

]]

}

IntegrityRTD-InfoBounds-r18 ::= SEQUENCE {

meanRTD-r18 INTEGER (0..255),

stdDevRTD-r18 StdDevRTD-r18,

...

}

StdDevRTD-r18 ::= SEQUENCE {

value-r18 INTEGER (0..31),

resolution-r18 ENUMERATED {mdot1, m1, m10, m30, ...}

}

NR-RTD-Info-v18xy ::= SEQUENCE{

nr-IntegrityParametersRTD-Info-r18 NR-IntegrityParametersRTD-Info-r18 OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *NR-RTD-Info* field descriptions |
| --- |
| ***referenceTRP-RTD-Info***  This field defines the reference TRP for the RTD and comprises the following sub-fields:  - ***dl-PRS-ID-Ref***: 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, and is associated to the reference TRP.  - ***nr-PhysCellId-Ref***: This field specifies the physical cell identity of the reference TRP.  - ***nr-CellGlobalId-Ref***: This field specifies the NCGI, the globally unique identity of a cell in NR, of the reference TRP.  - ***nr-ARFCN-Ref***: This field specifies the NR-ARFCN of the TRP's CD-SSB (as defined in TS 38.300 [47]) corresponding to *nr-PhysCellID*.  - ***refTime***: This field specifies the reference time at which the *rtd-InfoList* is valid. The *systemFrameNumber* choice refers to the SFN of the reference TRP.  - ***rtd-RefQuality***: This field specifies the quality of the timing of reference TRP, used to determine the RTD values provided in *rtd-InfoList*. |
| ***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 for which the *RTD-InfoElement* is applicable. |
| ***nr-PhysCellID***  This field specifies the physical cell identity of the associated TRP for which the *RTD-InfoElement* is applicable, 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 for which the *RTD-InfoElement* is applicable, as defined in TS 38.331 [35]. The server should include this field if it considers that it is needed to resolve ambiguity in the TRP indicated by *nr-PhysCellID*. |
| ***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* for which the *RTD-InfoElement* is applicable. |
| ***subframeOffset***  This field specifies the subframe boundary offset at the TRP antenna location between the reference TRP and this neighbour TRP in time units  where Hz and  (TS 38.211 [41]).  The offset is counted from the beginning of a subframe #0 of the reference TRP to the beginning of the closest subsequent subframe of this neighbour TRP.  Scale factor 1 Tc. |
| ***rtd-Quality***  This field specifies the quality of the RTD. |
| ***integrityRTD-InfoBounds***  This field specifies an overbounding model that bounds the inter-TRP synchronization error between reference TRP and this TRP. This field comprises the following sub-fields:  - ***meanRTD***: This field specifies the mean value of the inter-TRP synchronization error bound of the overbounding model. The bound is *meanRTD* + K \* *stdDevRTD* and shall be so that the probability of it to be exceeded shall be lower than IRallocation for ir-Minimum < IRallocation < ir-Maximum, where K = normInv(IRallocation / 2) and ir-Minimum, ir-Maximum as provided in IE *NR-IntegrityServiceParameters*.This IRallocation is a fraction of the Target Integrity Risk that represents the integrity risk budget available. Default value is 0 if absent.  - ***stdDevRTD***: This field specifies the standard deviation of the inter-TRP synchronization error bound of the overbounding model. The value field used in the *stdDevRTD* is provided in units of metres. The resolution is used in the value field of *stdDevRTD*. The enumerated values mdot1, m1, m10, m30 correspond to 0.1, 1, 10, 30 metres, respectively. |

============================ CHANGE ENDS============================================