**3GPP TSG-RAN WG2 Meeting #128 *R2-24xxxxx***

**Orlando, USA, 18th – 22nd November 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.355** | **CR** | **0013** | **rev** | **1** | **Current version:** | **18.3.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Corrections on capabilities for FG R1 41-1-19a and 41-1-19b in IE CommonSL-PRS-MethodsIEsProvideCapabilities | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2 | | | | |  | ***Date:*** | | | 2024-11-19 |
|  |  | | | |  | |  | | |  |
| ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The capabilities for FG R1 41-1-19a (*sl-PositioningMeasReportWithRxARP-ID*) and 41-1-19b (*sl-PRS-ReportTxARP-ID*) in IE *CommonSL-PRS-MethodsIEsProvideCapabilities* have been specified with IE type ENUMERATED {supported}.  However, acc. to the RAN1 NR UE features list in R1-2407385 (that was sent out after RAN1#118) the description of the components as well as the component candidate values have been changed for both FGs, see blue highlighted parts below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Index** | **Feature group** | **Components** |  | **Note** | | 41-1-19a | Report of Rx ARP-ID with SL positioning measurements | ~~Support provifing~~Maximum number of Rx ARP-IDs with SL positioning measurements |  | Component candidate values: {2,3,4}  Need for location server/UE to know if the feature is supported | | 41-1-19b | Report of Tx ARP-ID to LMF or another UE for the transmitted SL PRS | ~~Support provifing~~Maximum number of Tx ARP-IDs for the transmitted SL PRS |  | Component candidate values: {2,3,4}  Need for location server/UE to know if the feature is supported |   The above RAN1 changes for both FGs need to be implemented in SLPP specification.  Furthermore, according to discussion in RAN2#128 meeting the issue on FG 41-1-19a also exists in the capability signaling for each individual positioning method. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. In IE *CommonSL-PRS-MethodsIEsProvideCapabilities* the existing capabilities for FG R1 41-1-19a and 41-1-19b have been dummified. 2. In IE *CommonSL-PRS-MethodsIEsProvideCapabilities* the capabilities for FG R1 41-1-19a (*sl-PositioningMeasReportWithRxARP-ID*) and 41-1-19b (*sl-PRS-ReportTxARP-ID*) have been re-introduced with IE type ENUMERATED {n2, n3, n4}. 3. In *CommonSL-PRS-MethodsIEsProvideCapabilities* field descriptions, the descriptions of the capabilities *sl-PositioningMeasReportWithRxARP-ID* and *sl-PRS-ReportTxARP-ID* have been corrected to be aligned with the RAN1 NR UE features list. 4. In *SL-AoA-ProvideCapabilities*, *SL-RTT-ProvideCapabilities*, *SL-TDOA-ProvideCapabilities*, *SL-TOA-ProvideCapabilities*: in ASN.1 the existing capability *measurementsForMultipleARP-IDs-Rx* has been dummified and re-introduced with IE type ENUMERATED {n2, n3, n4}. Furthermore, the description of *measurementsForMultipleARP-IDs-Rx* has been corrected to be aligned with the RAN1 NR UE features list.   **Impact analysis**  Impacted 5G architecture options:  NR SA  Impacted functionality:  SL positioning capability signaling  Inter-operability:   * If the network is implemented according to the CR and the UE is not, then the UE may provide the network the maximum number of 4 Rx ARP-IDs with SL positioning measurements or 4 Tx ARP-IDs for the transmitted SL PRS. * If the UE is implemented according to the CR and the network is not, then the network may expect the UE to provide the maximum number of 4 Rx ARP-IDs with SL positioning measurements or 4 Tx ARP-IDs for the transmitted SL PRS. * If one UE is implemented according to the CR and the other UE is not, then the other UE may expect the UE to provide the maximum number of 4 Rx ARP-IDs with SL positioning measurements or 4 Tx ARP-IDs for the transmitted SL PRS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The capability signaling and description for FG R1 41-1-19a and 41-1-19b in IE *CommonSL-PRS-MethodsIEsProvideCapabilities* remains misaligned with the RAN1 NR UE features list. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.6, 6.7, 6.8, 6.9, 6.10 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*Start of changes*

## 6.6 SLPP PDU Common SL-PRS Methods Contents

<Text omitted>

#### *– CommonSL-PRS-MethodsIEsProvideCapabilities*

-- ASN1START

-- TAG-COMMONSL-PRS-METHODSIESPROVIDECAPABILITIES-START

CommonSL-PRS-MethodsIEsProvideCapabilities ::= SEQUENCE {

--R1 41-1-1a Common SL-PRS processing capability per UE

sl-PRS-CommonProcCapabilityPerUE SL-PRS-CommonProcCapabilityPerUE OPTIONAL,

sl-PRS-CapabilityBandList SEQUENCE (SIZE (1..nrMaxBands)) OF SL-PRS-CapabilityPerBand,

...

}

SL-PRS-CapabilityPerBand ::= SEQUENCE {

freqBandIndicatorNR INTEGER (1..1024),

--R1 41-1-1 Common SL-PRS processing capability in an SL BWP

sl-PRS-CommonProcCapabilityPerBand SL-PRS-CommonProcCapabilityPerBand OPTIONAL,

--R1 41-1-19 ARP location provision for sidelink as assistance data

sl-PositioningARP-LocationProvision ENUMERATED {supported} OPTIONAL,

dummy1 ENUMERATED {supported} OPTIONAL,

dummy2 ENUMERATED {supported} OPTIONAL,

--R1 41-1-2 Receiving SL-PRS in a shared resource pool

sl-PRS-RxInSharedResourcePool ENUMERATED {supported} OPTIONAL,

--R1 41-1-3 Receiving SL-PRS in a dedicated resource pool

sl-PRS-RxInDedicatedResourcePool SL-PRS-RxInDedicatedResourcePool OPTIONAL,

--R1 41-1-4a Transmitting SL-PRS in a shared resource pool

sl-PRS-TxInSharedResourcePool ENUMERATED {supported} OPTIONAL,

--R1 41-1-4b Transmitting SL-PRS mode 1 in a dedicated resource pool

sl-PRS-TxScheme1InDedicatedResourcePool ENUMERATED {supported} OPTIONAL,

--R1 41-1-4c Transmitting SL-PRS mode 2 in a dedicated resource pool

sl-PRS-TxScheme2InDedicatedResourcePool ENUMERATED {supported} OPTIONAL,

--R1 41-1-7e SL PRS measurement for SL PRS-RSRP

sl-PRS-RSRP-Meas ENUMERATED {supported} OPTIONAL,

--R1 41-1-7f SL PRS measurement for SL PRS-RSRPP

sl-PRS-RSRPP-Meas ENUMERATED {supported} OPTIONAL,

--R1 41-1-11 TDM-based multiplexing of SL-PRS reception from different UEs in the same slot in dedicated resource pool

sl-PRS-TDM-Multiplexing ENUMERATED {supported} OPTIONAL,

--R1 41-1-12 Comb-based multiplexing for SL-PRS reception from different UEs in the same slot in dedicated resource pool

sl-PRS-RxCombMultiplexing ENUMERATED {supported} OPTIONAL,

--R1 41-1-13 Reporting the additional paths for SL positioning

sl-PRS-AdditionalPathsReport ENUMERATED {n1,n2,n4,n6,n8} OPTIONAL,

--R1 41-1-14 LoS/NLoS indicator for SL positioning per measurement

sl-PRS-LOS-NLOS-Indication ENUMERATED {hard, hard-soft} OPTIONAL,

-- R1 41-1-20: Supports SL PRS Rx for a band configured with SL CA

sl-PRS-RxForBandWithSL-CA ENUMERATED {supported} OPTIONAL,

-- R1 41-1-21: Supports SL PRS Tx for a band configured with SL CA

sl-PRS-TxForBandWithSL-CA ENUMERATED {supported} OPTIONAL,

...,

[[

--R1 41-1-19a Report of Rx ARP-ID with SL positioning measurements

sl-PositioningMeasReportWithRxARP-ID ENUMERATED {n2, n3, n4} OPTIONAL,

--R1 41-1-19b Report of Tx ARP-ID to LMF or another UE for the transmitted SL PRS

sl-PRS-ReportTxARP-ID ENUMERATED {n2, n3, n4} OPTIONAL

]]

}

SL-PRS-CommonProcCapabilityPerUE ::= SEQUENCE {

--R1 41-1-1a Common SL-PRS processing capability

maxNumOfActiveSL-PRS-Resources SEQUENCE {

fr1 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24} OPTIONAL,

fr2 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128} OPTIONAL

},

maxNumOfSlotswithActiveSL-PRS-Resources SEQUENCE {

fr1 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL,

fr2 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

}

}

SL-PRS-CommonProcCapabilityPerBand ::= SEQUENCE {

maxSL-PRS-Bandwidth CHOICE {

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

fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

},

maxNumOfActiveSL-PRS-ResourcesInOneSlot CHOICE {

fr1 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24},

fr2 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128}

},

maxNumOfSlotsWithActiveSL-PRS-Resources CHOICE {

fr1 ENUMERATED {n1, n2, n3, n4, n6, n8},

fr2 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64}

},

minTimeAfterEndofSlotCarryActiveSL-PRS-Resources ENUMERATED {ms20, ms30, ms40, ms50, ms80, ms100, ms160}

}

SL-PRS-RxInDedicatedResourcePool ::= SEQUENCE {

numOfSupportedRxPSCCH-PerSlot ENUMERATED {value1, value2},

supportedCP-TypeFor60kHzSCS ENUMERATED {ncp, ncpAndECP}

}

-- TAG-COMMONSL-PRS-METHODSIESPROVIDECAPABILITIES-STOP

-- ASN1STOP

|  |
| --- |
| *CommonSL-PRS-MethodsIEsProvideCapabilities* field descriptions |
| ***dummy1, dummy2***  The fields are not used in the specification. If received it shall be ignored by the receiving endpoint. |
| ***sl-PositioningARP-LocationProvision***  Indicates whether UE supports provisioning of ARP location for sidelink as assistance data. |
| ***sl-PositioningMeasReportWithRxARP-ID***  Indicates the maximum number of Rx ARP-IDs with SL positioning measurements that the UE supports. |
| ***sl-PRS-AdditionalPathsReport***  Indicates whether UE supports RSRPP reporting for additional paths.  The value indicates the maximum number of additional detected path timing reporting for K additional paths for SL positioning.  UE supporting this feature shall also support at least one of *sl-PRS-RSTD-Meas*, *sl-RTOA-Meas*, *sl-PRS-RxTxTimeDiffWithoutTxTimeStamp*, *sl-PRS-RxTxTimeDiffWithTxTimeStamp*, *sl-PRS-RSRPP-Meas*, or *sl-AoA-Meas*. |
| ***sl-PRS-CommonProcCapabilityPerBand***  Indicates the common SL-PRS processing capability per band, and comprises the following sub-fields:  - *maxSL-PRS-Bandwidth*: Maximum SL PRS bandwidth in MHz in a resource pool for positioning, which is supported and reported by UE for SL-PRS measurement;  - *maxNumOfActiveSL-PRS-ResourcesInOneSlot*: Maximum number of active SL PRS resources across all configured RPs in a slot assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE;  - *maxNumOfSlotsWithActiveSL-PRS-Resources*: Maximum number of slots with active SL PRS resources across all configured RPsassuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE;  - *minTimeAfterEndofSlotCarryActiveSL-PRS-Resources*: Minimum time after the end of a slot carrying the active SL-PRS resource(s) assuming maximum number of symbols and maximum bandwidth for a UE to finish the SL-PRS resource and the associated PSCCH processing which is supported and reported by UE;  NOTE 1: An SL PRS resource is considered as active starting at the end of the last symbol of the PSCCH carrying the SCI trigger and the occupancy is released at the end of timeline indicated in *minTimeAfterEndofSlotCarryActiveSL-PRS-Resources*. |
| ***sl-PRS-CommonProcCapabilityPerUE***  Indicates the common SL-PRS processing capability, and comprises the following sub-fields:  - *maxNumOfActiveSL-PRS-Resources*: Maximum number of active SL PRS resources across all configured RPs across all bands in a slot assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE;  - *maxNumOfSlotswithActiveSL-PRS-Resources*: Maximum number of slots with active SL PRS resources across all configured RPsacross all bands assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***sl-PRS-LOS-NLOS-Indication***  Indicates whether UE supports LoS/NLoS indicator for SL positioning per measurement.  The value indicates whether the indicator is hard value or hard+soft value.  UE supporting this feature shall also support at least one of *sl-PRS-RSTD-Meas*, *sl-RTOA-Meas*, *sl-PRS-RxTxTimeDiffWithoutTxTimeStamp*, *sl-PRS-RxTxTimeDiffWithTxTimeStamp*, or *sl-AoA-Meas*. |
| ***sl-PRS-ReportTxARP-ID***  Indicates the maximum number of Tx ARP-IDs that the UE supports for the transmitted SL PRS. |
| ***sl-PRS-RSRP-Meas***  Indicates whether UE supports SL PRS measurement for SL PRS-RSRP, and is comprised of the following functional components:  - Support SL PRS-RSRP measurement based on SL-PRS;  - Support SL PRS-RSRP measurement reporting.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***sl-PRS-RSRPP-Meas***  Indicates whether UE supports SL PRS measurement for SL PRS-RSRPP, and is comprised of the following functional components:  - Support SL PRS-RSRPP measurement based on SL-PRS;  - Support SL PRS-RSRPP measurement reporting.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***sl-PRS-RxCombMultiplexing***  Indicates whether UE supports comb-based multiplexing for SL-PRS reception from different UEs in the same slot in dedicated resource pool.  UE supporting this feature shall also support *sl-PRS-RxInDedicatedResourcePool*. |
| ***sl-PRS-RxForBandWithSL-CA***  Indicates whether UE supports SL PRS reception in a single carrier for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA.  A UE that supports this feature shall also support *sl-CA-Communication-r18*, defined in TS 38.331 [2] and one of *sl-PRS-RxInSharedResourcePool* or *sl-PRS-RxInDedicatedResourcePool*.  NOTE 1: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  NOTE 2: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. |
| ***sl-PRS-RxInDedicatedResourcePool***  Indicates whether UE supports receiving SL-PRS in dedicated resource pool and receiving SCI format 1B.  This field comprises the following sub-fields:  - *numOfSupportedRxPSCCH-PerSlot*: Indicates the number of PSCCH UE can receive in a slot. value1 corresponds to floor (NRB /10 RBs), value2 corresponds to 2\*floor (NRB /10 RBs). NRB is the number of RBs defined per channel bandwidth in TS 38.101-1 [11] Table 5.3.2-1 for FR1 and TS 38.101-2 [10] Table 5.3.2-1 for FR2.  - *supportedCP-TypeFor60kHzSCS*: Indicates the supported CP type for 60 kHz SCS.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***sl-PRS-RxInSharedResourcePool***  Indicates whether UE supports receiving SL-PRS in shared resource pool and receiving SCI format 2D.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand* and *sl-Reception-r16* defined in TS 38.331 [2]. |
| ***sl-PRS-TDM-Multiplexing***  Indicates whether UE supports TDM-based multiplexing of SL-PRS reception from different UEs in the same slot in dedicated resource pool.  UE supporting this feature shall also support*sl-PRS-RxInDedicatedResourcePool*. |
| ***sl-PRS-TxForBandWithSL-CA***  Indicates whether UE supports SL PRS transmission in a single carrier for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA.  A UE that supports this feature shall also support *sl-CA-Communication-r18*, defined in TS 38.331 [2] and one of *sl-PRS-TxInSharedResourcePool, sl-PRS-TxScheme1InDedicatedResourcePool,* or *sl-PRS-TxScheme2InDedicatedResourcePool*.  NOTE 1: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  NOTE 2: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. |
| ***sl-PRS-TxInSharedResourcePool***  Indicates whether UE supports transmitting SL-PRS in a shared resource pool, and is comprised of the following functional components:  - Support transmitting SL-PRS in shared resource pool;  - Support transmitting SCI format 2D;  - Support downlink pathloss based open loop power control.  The supported resource allocation modes are the same as for communication and signaled in *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16* defined in TS 38.331 [2]*.*  UE supporting this feature shall also support *sl-TransmissionMode1-r16* or *sl-TransmissionMode2-r16* defined in TS 38.331 [2], and *sl-PRS-RxInSharedResourcePool*. |
| ***sl-PRS-TxScheme1InDedicatedResourcePool***  Indicates whether UE supports transmitting SL-PRS scheme 1 in a dedicated resource pool, and is comprised of the following functional components:  - Support transmitting SL-PRS and PSCCH within a slot without PSSCH in dedicated resource pool;  - Support transmitting SL-PRS according to the mapping rule between PSCCH and SL-PRS;  - Support transmitting SCI format 1B;  - Support receiving DCI format 3\_2;  - Support downlink pathloss based open loop power control of SL-PRS (NOTE 1).  UE supporting this feature shall also support *sl-PRS-RxInDedicatedResourcePool*.  NOTE 1: It is not required to be supported in a band indicated with only the PC5 interface in TS 38.101-1 [11] Table 5.2E.1-1. |
| ***sl-PRS-TxScheme2InDedicatedResourcePool***  Indicates whether UE supports transmitting SL-PRS scheme 2 in a dedicated resource pool, and is comprised of the following functional components:  - Support transmitting SL-PRS and PSCCH within a slot without PSSCH in dedicated resource pool;  - Support transmitting SL-PRS according to the mapping rule between PSCCH and SL-PRS;  - Support transmitting SCI format 1B.  UE supporting this feature shall also support at least one of *sl-PRS-TxRandomSelection-r18* or *sl-PRS-TxUsingFullSensing-r18* defined in TS 38.331 [2]. |

*Next change*

## 6.7 SLPP PDU SL-AoA Contents

<Text omitted>

#### *– SL-AoA-ProvideCapabilities*

The IE *SL-AoA-ProvideCapabilities* is used to indicate the support of SL-AoA and to provide SL-AoA positioning capabilities.

-- ASN1START

-- TAG-SL-AOA-PROVIDECAPABILITIES-START

SL-AoA-ProvideCapabilities ::= SEQUENCE {

positioningModes PositioningModes,

tenMsUnitResponseTime PositioningModes OPTIONAL,

periodicalReporting PositioningModes OPTIONAL,

scheduledLocationRequestSupported ScheduledLocationTimeSupportPerMode OPTIONAL,

locationCoordinateTypes LocationCoordinateTypes OPTIONAL,

velocityTypes VelocityTypes OPTIONAL,

sl-AoA-CapabilityBandList SEQUENCE (SIZE (1..nrMaxBands)) OF SL-AoA-CapabilityPerBand,

...

}

SL-AoA-CapabilityPerBand ::= SEQUENCE {

--R1 41-1-7g SL PRS measurement for SL AoA

sl-AoA-Meas BIT STRING { gcs (0), lcsWithTranslation (1), lcsWithoutTranslation (2) } (SIZE (1..8))

OPTIONAL,

dummy ENUMERATED { supported } OPTIONAL,

...,

[[

measurementsForMultipleARP-IDs-Rx ENUMERATED {n2, n3, n4} OPTIONAL

]]

}

-- TAG-SL-AOA-PROVIDECAPABILITIES-STOP

-- ASN1STOP

|  |
| --- |
| *SL-AoA-ProvideCapabilities* field descriptions |
| ***locationCoordinateTypes***  This parameter identifies the geographical location coordinate types that a target UE supports for SL-AoA. TRUE indicates that a location coordinate type is supported and FALSE indicates that it is not. |
| ***measurementsForMultipleARP-IDs-Rx***  This field, if present, indicates the maximum number of Rx ARP-IDs with SL-AoA measurements that the UE supports. |
| ***periodicalReporting***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support *periodicalReporting* in IE *CommonIEsRequestLocationInformation*. |
| ***positioningModes***  This field specifies the SL-AoA mode(s) supported by the UE. |
| ***scheduledLocationRequestSupported***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support scheduled location requests. |
| ***sl-AoA-Meas***  Indicates whether UE supports SL PRS measurement for SL-AoA, and is comprised of the following functional components:  - Support SL AoA measurement based on SL-PRS;  - Support SL AoA measurement reporting types.  The value indicates the supported SL AoA measurement reporting types. The left most bit in the bitmap corresponds to GCS, the next bit in the bitmap corresponds to LCS with translation, the right most bit in the bitmap corresponds to LCS without translation. A bit in the bitmap is set to 1 if the corresponding type is supported by the UE.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***tenMsUnitResponseTime***  This field, if present, specifies the positioning modes for which the UE supports the enumerated value '*tenMilliSeconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. This is represented by a bit string, with a one value at the bit position means '*tenMilliSeconds*' response time unit for the positioning mode is supported; a zero value means not supported. If this field is absent, the UE does not support '*tenMilliSeconds*' response time unit in *CommonIEsRequestLocationInformation*. |
| ***velocityTypes***  This parameter identifies the velocity types that a target UE supports for SL-AoA. TRUE indicates that a velocity type is supported and FALSE indicates that it is not. If this field is absent, velocity reporting is not supported. |

*Next change*

## 6.8 SLPP PDU SL-RTT Contents

<Text omitted>

#### *– SL-RTT-ProvideCapabilities*

The IE *SL-RTT-ProvideCapabilities* is used to indicate the support of SL-RTT and to provide SL-RTT positioning capabilities.

-- ASN1START

-- TAG-SL-RTT-PROVIDECAPABILITIES-START

SL-RTT-ProvideCapabilities ::= SEQUENCE {

positioningModes PositioningModes,

tenMsUnitResponseTime PositioningModes OPTIONAL,

periodicalReporting PositioningModes OPTIONAL,

scheduledLocationRequestSupported ScheduledLocationTimeSupportPerMode OPTIONAL,

locationCoordinateTypes LocationCoordinateTypes OPTIONAL,

velocityTypes VelocityTypes OPTIONAL,

sl-RTT-CapabilityBandList SEQUENCE (SIZE (1..nrMaxBands)) OF SL-RTT-CapabilityPerBand,

...

}

SL-RTT-CapabilityPerBand ::= SEQUENCE {

--R1 41-1-7c SL PRS measurement for UE Rx–Tx time difference without Tx time stamp

sl-PRS-RxTxTimeDiffWithoutTxTimeStamp ENUMERATED {n1,n2,n3,n4} OPTIONAL,

--R1 41-1-7d SL PRS measurement for UE Rx–Tx time difference with Tx time stamp

sl-PRS-RxTxTimeDiffWithTxTimeStamp SEQUENCE {

numOfMeasForSameSL-PRS ENUMERATED {n1,n2,n3,n4},

maxMeasReportingForDiffSL-PRS ENUMERATED {n1,n2,n3,n4}

} OPTIONAL,

dummy ENUMERATED { supported } OPTIONAL,

...,

[[

measurementsForMultipleARP-IDs-Rx ENUMERATED {n2, n3, n4} OPTIONAL

]]

}

-- TAG-SL-RTT-PROVIDECAPABILITIES-STOP

-- ASN1STOP

|  |
| --- |
| *SL-RTT-ProvideCapabilities* field descriptions |
| ***locationCoordinateTypes***  This parameter identifies the geographical location coordinate types that a target UE supports for SL-RTT. TRUE indicates that a location coordinate type is supported and FALSE that it is not. |
| ***measurementsForMultipleARP-IDs-Rx***  This field, if present, indicates the maximum number of Rx ARP-IDs with SL-RTT measurements that the UE supports. |
| ***periodicalReporting***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support *periodicalReporting* in IE *CommonIEsRequestLocationInformation*. |
| ***positioningModes***  This field specifies the SL-RTT mode(s) supported by the UE. |
| ***scheduledLocationRequestSupported***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support scheduled location requests. |
| ***sl-PRS-RxTxTimeDiffWithoutTxTimeStamp***  Indicates whether UE supports SL PRS measurement for UE Rx–Tx time difference without Tx time stamp, and is comprised of the following functional components:  - Support UE Rx–Tx time difference measurement based on SL PRS;  - Support UE Rx–Tx time difference measurement reporting without Tx time stamp.  The value indicates the supported maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*, and at least one of *sl-PRS-TxInSharedResourcePool*, *sl-PRS-TxScheme1InDedicatedResourcePool* or *sl-PRS-TxScheme2InDedicatedResourcePool*. |
| ***sl-PRS-RxTxTimeDiffWithTxTimeStamp***  Indicates whether UE supports SL PRS measurement for UE Rx–Tx time difference with Tx time stamp, and is comprised of the following functional components:  - Support UE Rx–Tx time difference measurement based on SL PRS;  - Support UE Rx–Tx time difference measurement reporting with Tx time stamp;  This field comprises the following sub-fields:  - *numOfMeasForSameSL-PRS*: indicates the reported number of Rx-Tx measurements for the same SL-PRS transmission (or reception) and different SL-PRS reception (or transmission) for the same pair of UEs;  - *maxMeasReportingForDiffSL-PRS*: indicates the supported maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*, and at least one of *sl-PRS-TxInSharedResourcePool*, *sl-PRS-TxScheme1InDedicatedResourcePool* or *sl-PRS-TxScheme2InDedicatedResourcePool*. |
| ***tenMsUnitResponseTime***  This field, if present, specifies the positioning modes for which the UE supports the enumerated value '*tenMilliSeconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. This is represented by a bit string, with a one value at the bit position means '*tenMilliSeconds*' response time unit for the positioning mode is supported; a zero value means not supported. If this field is absent, the UE does not support '*tenMilliSeconds*' response time unit in *CommonIEsRequestLocationInformation*. |
| ***velocityTypes***  This parameter identifies the velocity types that a target UE supports for SL-RTT. TRUE indicates that a velocity type is supported and FALSE that it is not. If this field is absent, velocity reporting is not supported. |

*Next change*

## 6.9 SLPP PDU SL-TDOA Contents

<Text omitted>

#### *– SL-TDOA-ProvideCapabilities*

The IE *SL-TDOA-ProvideCapabilities* is used to indicate the support of SL-TDOA and to provide SL-TDOA positioning capabilities.

-- ASN1START

-- TAG-SL-TDOA-PROVIDECAPABILITIES-START

SL-TDOA-ProvideCapabilities ::= SEQUENCE {

positioningModes PositioningModes,

tenMsUnitResponseTime PositioningModes OPTIONAL,

periodicalReporting PositioningModes OPTIONAL,

scheduledLocationRequestSupported ScheduledLocationTimeSupportPerMode OPTIONAL,

locationCoordinateTypes LocationCoordinateTypes OPTIONAL,

velocityTypes VelocityTypes OPTIONAL,

sl-TDOA-CapabilityBandList SEQUENCE (SIZE (1..nrMaxBands)) OF SL-TDOA-CapabilityPerBand,

...

}

SL-TDOA-CapabilityPerBand ::= SEQUENCE {

--R1 41-1-7a SL PRS measurement for SL-RSTD

sl-PRS-RSTD-Meas ENUMERATED {n1,n2,n3,n4} OPTIONAL,

dummy ENUMERATED { supported } OPTIONAL,

...,

[[

measurementsForMultipleARP-IDs-Rx ENUMERATED {n2, n3, n4} OPTIONAL

]]

}

-- TAG-SL-TDOA-PROVIDECAPABILITIES-STOP

-- ASN1STOP

|  |
| --- |
| *SL-TDOA-ProvideCapabilities* field descriptions |
| ***locationCoordinateTypes***  This parameter identifies the geographical location coordinate types that a target UE supports for SL-TDOA. TRUE indicates that a location coordinate type is supported and FALSE that it is not. |
| ***measurementsForMultipleARP-IDs-Rx***  This field, if present, indicates the maximum number of Rx ARP-IDs with SL-TDOA measurements that the UE supports. |
| ***periodicalReporting***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support *periodicalReporting* in IE *CommonIEsRequestLocationInformation*. |
| ***positioningModes***  This field specifies the SL-TDOA mode(s) supported by the UE. |
| ***scheduledLocationRequestSupported***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support scheduled location requests. |
| ***sl-PRS-RSTD-Meas***  Indicates whether UE supports SL PRS measurement for SL-RSTD, and is comprised of the following functional components:  - Support SL RSTD measurement based on SL-PRS;  - Support SL RSTD measurement reporting;  The value indicates the supported maximum number of SL RSTD measurement reporting for different SL-PRS reception for the same pair of UEs.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***tenMsUnitResponseTime***  This field, if present, specifies the positioning modes for which the UE supports the enumerated value '*tenMilliSeconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. This is represented by a bit string, with a one value at the bit position means '*tenMilliSeconds*' response time unit for the positioning mode is supported; a zero value means not supported. If this field is absent, the UE does not support '*tenMilliSeconds*' response time unit in *CommonIEsRequestLocationInformation*. |
| ***velocityTypes***  This parameter identifies the velocity types that a target UE supports for SL-TDOA. TRUE indicates that a velocity type is supported and FALSE that it is not. If this field is absent, velocity reporting is not supported. |

*Next change*

## 6.10 SLPP PDU SL-TOA Contents

<Text omitted>

#### *– SL-TOA-ProvideCapabilities*

The IE *SL-TOA-ProvideCapabilities* is used to indicate the support of SL-TOA and to provide SL-TOA positioning capabilities.

-- ASN1START

-- TAG-SL-TOA-PROVIDECAPABILITIES-START

SL-TOA-ProvideCapabilities ::= SEQUENCE {

positioningModes PositioningModes,

tenMsUnitResponseTime PositioningModes OPTIONAL,

periodicalReporting PositioningModes OPTIONAL,

scheduledLocationRequestSupported ScheduledLocationTimeSupportPerMode OPTIONAL,

locationCoordinateTypes LocationCoordinateTypes OPTIONAL,

velocityTypes VelocityTypes OPTIONAL,

sl-TOA-CapabilityBandList SEQUENCE (SIZE (1..nrMaxBands)) OF SL-TOA-CapabilityPerBand,

...

}

SL-TOA-CapabilityPerBand ::= SEQUENCE {

--R1 41-1-7b SL PRS measurement for SL RTOA

sl-RTOA-Meas ENUMERATED {n1,n2,n3,n4} OPTIONAL,

dummy ENUMERATED { supported } OPTIONAL,

...,

[[

measurementsForMultipleARP-IDs-Rx ENUMERATED {n2, n3, n4} OPTIONAL

]]

}

-- TAG-SL-TOA-PROVIDECAPABILITIES-STOP

-- ASN1STOP

|  |
| --- |
| *SL-TOA-ProvideCapabilities* field descriptions |
| ***locationCoordinateTypes***  This parameter identifies the geographical location coordinate types that a target UE supports for SL-TOA. TRUE indicates that a location coordinate type is supported and FALSE that it is not. |
| ***measurementsForMultipleARP-IDs-Rx***  This field, if present, indicates the maximum number of Rx ARP-IDs with SL-TOA measurements that the UE supports. |
| ***periodicalReporting***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support *periodicalReporting* in IE *CommonIEsRequestLocationInformation*. |
| ***positioningModes***  This field specifies the SL-TOA mode(s) supported by the UE. |
| ***scheduledLocationRequestSupported***  This field, if present, specifies the positioning modes for which the UE 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 UE does not support scheduled location requests. |
| ***sl-RTOA-Meas***  Indicates whether UE supports SL PRS measurement for SL-RTOA, and is comprised of the following functional components:  - Support SL RTOA measurement based on SL-PRS;  - Support SL RTOA measurement reporting.  The value indicates the supported maximum number of SL RTOA measurement reporting for different SL-PRS reception for the same pair of UEs.  UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand*. |
| ***tenMsUnitResponseTime***  This field, if present, specifies the positioning modes for which the UE supports the enumerated value '*tenMilliSeconds*' in the IE *ResponseTime* in IE *CommonIEsRequestLocationInformation*. This is represented by a bit string, with a one value at the bit position means '*tenMilliSeconds*' response time unit for the positioning mode is supported; a zero value means not supported. If this field is absent, the UE does not support '*tenMilliSeconds*' response time unit in *CommonIEsRequestLocationInformation*. |
| ***velocityTypes***  This parameter identifies the velocity types that a target UE supports for SL-TOA. TRUE indicates that a velocity type is supported and FALSE that it is not. If this field is absent, velocity reporting is not supported. |

*End of changes*