3GPP TSG RAN WG2 Meeting #117-e R2-220xxxx

**Electronic meeting, 21 Feb- 3 March, 2022**

**Agenda item:** 8.11.2.7

**Source:** Intel Corporation

**Title:** Report of [AT117-e][605][POS] Capability running CRs (Intel)

**Document for:**  Discussion and decision

# Introduction

This is the report of following offline discussion:

* [AT117-e][605][POS] Capability running CRs (Intel)

      Scope: Review and update the following CRs:

* R2-2202495 (capability running CR to 38.331)
* R2-2202496 (capability running CR to 38.306)

      Intended outcome: Endorsable CRs

      Deadline:  Friday 2022-02-25 1000 UTC

Please provide your comments in the discussion report before Thursday 2022-02-24 1000 UTC, i.e. one day before the deadline, so we have time to update the CRs accordingly.

# Annex: companies’ point of contact

|  |  |  |
| --- | --- | --- |
| **Company** | **Point of contact** | **Email address** |
| Intel Corporation | Yi Guo | Yi.guo@intel.com |
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# Discussion

## 3.1 Discussion on RRC related capabilities

Based on Pre117-612 in R2-2202494, R2-2202495 (capability running CR to 38.331) and R2-2202496 (capability running CR to 38.306) captured following RAN1/RAN4 UE feature lists.

* TEG 27-1-2;
* PPW 27-3-2, 27-3-2a
* Preconfigured MG 27-10, 27-11
* Positioning in RRC\_INACTIVE 27-15, 27-15a, 27-16, 27-17, 27-18a, 27-18b, 27-18c, 27-19
* RAN4 per-FR MG for PRS measurement 14-1

Note: LPP related changes (proposed in R2-2202494) should be captured in LPP running CR directly.

**Discussion point 3.1-1: For RRC related changes, companies are invited to provide comments, suggestions if any.**

Note: For RAN1/RAN4 feature lists, Rapporteur will update CRs (resolve FFSs) accordingly once RAN1 and RAN4 update their UE feature lists;

|  |  |  |
| --- | --- | --- |
| **Company’s name** | **RRC Section x****306 Section y** | **Comments** |
|  |  |  |
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|  |  |  |

## 3.2 Correction on Proposal point 3.3.2-1 in R2-2202494

For LPP related changes, 27-2-2 is indicted as FR1/FR2 diff, and therefore two separate capabilities should be captured, i.e. the proposal in R2-2202494 is incorrect.

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| 27-2-2 | DL PRS RSRP reporting for more than 8 measurements for UE-assisted DL-AoD positioning | Support reporting K> 8 DL PRS RSRP measurements per TRP.Note: Multiple RSRPs corresponding to same or different Rx Beam index should be able to be reported for a given PRS resource for different timestamps.  | 13-5 | No |  | UE report of more than 8 DL PRS-RSRP is not supported.  | Per UE | n/a | Yes | n/a | The candidate values are {16, 24}Need for location server to know if the feature is supportedThe maximum number of reported DL PRS RSRP in the capability signaling should be no less than the maximum number of reported DL PRS RSRPP of the first path in the capability signaling | Optional with capability signaling |

The changes should be (highlighted in green):

**Proposal point 3.3.2-1: [for agreements] 27-2, 27-13, 27-13a, 27-14, 27-14a are captured as**

**LPP TP:**

**DL-AoD**

 ...,

 [[

 maxDL-PRS-FirstPathRSRP-MeasPerTRP-r17 ENUMERATED { n2, n4, n8, n16, n24 } OPTIONAL, --27-2-1, FFS per UE or Per band

 supportOfDL-PRS-FirstPathRSRP-Meas-r17 ENUMERATED { supported } OPTIONAL,--27-2-1, FFS per UE or Per band, FFS whether two items of 27-2-1 should be combined

 dl-PRS-RSRP-MeasAboveEightPerTRP-FR1-r17 ENUMERATED { n16, n24 } OPTIONAL, --27-2-2, ~~per UE FFS FR1/FR2?~~

 dl-PRS-RSRP-MeasAboveEightPerTRP-FR2-r17 ENUMERATED { n16, n24 } OPTIONAL --27-2-2, ~~per UE FFS FR1/FR2?~~

 ]]

Rapporteur expects that LPP running CR Rapporteur will take it into account, therefore we do not need to discuss this here.

# Background in Pre117-e612 (RRC related discussions)

## 3.3 Captured RAN1 feature lists (RRC related)

### 3.3.1 TEG 27-1-2

**Proposal point 3.3.1-1: [for agreements] [8/8] 27-1 TEG is captured as**

**TS38.331 TP:**

BandNR ::= SEQUENCE {

--Skip unrelated parts;--

 [[

 enhancedSkipUplinkTxConfigured-v1660 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxDynamic-v1660 ENUMERATED {supported} OPTIONAL

 ]],

 [[

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

 txDiversity-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 nr-UE-TxTEG-ID-MaxSupport-r17 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL -- 27-1-2 for UL TDOA

 ]]

}

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

**TS38.306 TP:**

| ***nonGroupSINR-reporting-r16***Indicates N\_max L1-SINR values reported when UE supports non-group based L1-SINR reporting. UE indicates support of this feature shall indicate support of *ssb-csirs-SINR-measurement-r16.* | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***nr-UE-TxTEG-ID-MaxSupport-r17***Indicates the maximum number of UE-TxTEG for SRS resource for positioning, which is supported and reported by UE for UL TDOA. | Band | No | N/A | N/A |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  27. NR\_pos\_enh | 27-1-2 | Support of UE-TxTEGs for UL TDOA  | The maximum number of UE-TxTEG for SRS resource for positioning, which is supported and reported by UE for UL TDOA  | 13-8 | Yes |  | UE-TxTEGs for UL TDOA is not supported and no assumption can be made on the [mitigation of] UE Tx timing error for the SRS resource for positioning | per band | n/a | n/a | n/a | The candidate values are {1,2,3,4,6,8}Need for location server to know if the feature is supportedNote: It should support the serving gNB to request the UE to provide the association information of UL SRS resources for positioning with Tx TEGs to the serving gNB for UL TDOA Note: If the UE does not include TxTEG-ID associated with a SRS resource for positioning, no assumption can be made on the UE Tx timing error for this SRS resource for positioning.  | Optional with capability signaling |

### 3.3.3 PPW 27-3-2, 27-3-2a

**Proposal point 3.3.3-1: [for agreements] 27-3/27-6 are captured as**

**TS38.331 TP:**

BandNR ::= SEQUENCE {

--Skip unrelated parts;--

 [[

 enhancedSkipUplinkTxConfigured-v1660 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxDynamic-v1660 ENUMERATED {supported} OPTIONAL

 ]],

 [[

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

 txDiversity-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 prs-ProcessingWindowType1A-r17 ENUMERATED { supported } OPTIONAL, -- 27-3-2

 prs-ProcessingWindowType1B-r17 ENUMERATED { supported } OPTIONAL, -- 27-3-2

 prs-ProcessingWindowType2-r17 ENUMERATED { supported } OPTIONAL, -- 27-3-2

 supportedPrioHandlingOutOfPPW-r17 ENUMERATED { option1, option2, option3 } OPTIONAL, -- 27-3-2a

 ]]

}

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

**TS38.306 TP :**

| ***powerBoosting-pi2BPSK***Indicates whether UE supports power boosting for pi/2 BPSK, when applicable as defined in 6.2 of TS 38.101-1 [2]. This capability is not applicable to IAB-MT. | Band | No | TDD only | FR1 only |
| --- | --- | --- | --- | --- |
| ***prs-ProcessingWindowType1A-r17***Indicates the UE supports the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from all DL CCs (per UE) are affected across LTE and NR. | Band | No | N/A | N/A |
| ***prs-ProcessingWindowType1B-r17***Indicates the UE supports the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from a certain band are affected (FFS FR2). | Band | No | N/A | N/A |
| ***prs-ProcessingWindowType2-r17***Indicates the UE supports the determination of prioritization between DL PRS and other DL signals/channels only in DL PRS symbols within the PRS processing window [The DL signals/channels from all DL CCs (per UE) are affected (FFS FR2)]. | Band | No | N/A | N/A |

| ***supportCodeWordSoftCombining-r16***Indicates whether UE supports codeword soft combining for FDMSchemeB. UE indicates support of this feature depends on whether the *supportFDM-SchemeB-r16* is also supported. | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***supportedPrioHandlingOutOfPPW-r17***Indicates the support of priority handing options of PRS when PRS measurement is outside MG. | Band | No | N/A | N/A |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27. NR\_pos\_enh | 27-3-2 | DL PRS measurement outside MG and in a PRS processing window - processing types | 1. Supported PRS processing types subject to the UE determining that DL PRS to be higher priority for PRS measurement outside MG and in a PRS processing windowNote:* Type 1A refers to the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from all DL CCs (per UE) are affected across LTE and NR
* Type 1B refers to the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from a certain band are affected (FFS FR2)
* Type 2 refers to the determination of prioritization between DL PRS and other DL signals/channels only in DL PRS symbols within the PRS processing window [The DL signals/channels from all DL CCs (per UE) are affected (FFS FR2)]

Note: When the UE determines higher priority for other DL signals/channels over the PRS measurement/processing, the UE is not expected to measure/process DL PRS which is applicable to all of the above capability optionsNote: Within a PRS processing window, UE measurement is inside the active DL BWP with PRS having the same numerology as the active DL BWP | 13-1 | Yes |  |  | per band | n/a | n/a | n/a | Component 1 candidate values: [One or more of] {Type 1A, Type 1B, Type 2}Need for location server to know if the feature is supportedNote: A UE that supports FG 27-3-2 also needs to support FG 27-3-2a | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-3-2a | Support of priority handing of PRS when PRS measurement is outside MG | Support of priority handing options of PRS: Option1, Option2 or Option3* 1. Option 1: UE may indicates support of two priority states.
		1. State 1: PRS is higher priority than all PDCCH/PDSCH/CSI-RS
		2. State 2: PRS is lower priority than all PDCCH/PDSCH/CSI-RS
	2. Option 2: UE may indicate support of three priority states
		1. State 1: PRS is higher priority than all PDCCH/PDSCH/CSI-RS
		2. State 2: PRS is lower priority than PDCCH and URLLC PDSCH and higher priority than other PDSCH/CSI-RS
			1. Note: The URLLC channel corresponds a dynamically scheduled PDSCH whose PUCCH resource for carrying ACK/NAK is marked as high-priority.
		3. State 3: PRS is lower priority than all PDCCH/PDSCH/CSI-RS
	3. Option 3: UE may indicate support of single priority state
		1. State 1: PRS is higher priority than all PDCCH/PDSCH/CSI-RS
 | [27-3-3] | Yes |  |  | Per band  | No | No | No | Candidate values: {option1, option2, option3}Note: A UE that supports FG 27-3-2a also needs to support FG 27-3-2Note: if the FFS in FG 27-2a gets resolved as “per band’, FG 27-2a will be deleted and becomes a component of FG 27-3-2 | Optional with capability signaling |

### 3.3.8 Preconfigured MG 27-10, 27-11

**Proposal point 3.3.8-1: [for agreements] 27-10, 27-10a, 27-11 are captured as**

**TS38.331 TP :**

MAC-ParametersCommon ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 lch-ToSCellRestriction ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 recommendedBitRate ENUMERATED {supported} OPTIONAL,

 recommendedBitRateQuery ENUMERATED {supported} OPTIONAL

 ]],

 [[

 recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL,

 preEmptiveBSR-r16 ENUMERATED {supported} OPTIONAL,

 autonomousTransmission-r16 ENUMERATED {supported} OPTIONAL,

 lch-PriorityBasedPrioritization-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToConfiguredGrantMapping-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToGrantPriorityRestriction-r16 ENUMERATED {supported} OPTIONAL,

 singlePHR-P-r16 ENUMERATED {supported} OPTIONAL,

 ul-LBT-FailureDetectionRecovery-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 8-1: MPE

 tdd-MPE-P-MPR-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 lcid-ExtensionIAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spCell-BFR-CBRA-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 srs-ResourceId-Ext-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 mg-ActivationRequestPRS-Meas-r17 ENUMERATED {supported} OPTIONAL, --27-10

 mg-ActivationCommPRS-Meas-r17 ENUMERATED {supported} OPTIONAL, --27-11

 ]]

}

**TS38.306 TP**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***longDRX-Cycle***Indicates whether UE supports long DRX cycle as specified in TS 38.321 [8]. | UE | Yes | Yes | No |
| ***mg-ActivationCommPRS-Meas-r17***Indicates the support of using DL MAC CE to activate the preconfigured MG for PRS measurements: . | UE | No | Yes | No |
| ***mg-ActivationRequestPRS-Meas-r17***Indicates the support of using UL MAC CE to request the activation of the preconfigured MG for PRS measurements: . | UE | No | Yes | No |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27. NR\_pos\_enh | 27-10 | Support of UL MAC CE based MG activation request for PRS measurements | 1. Support of using UL MAC CE to request measurement gap for PRS measurements: The information in the UL MAC CE for MG activation request by the UE can be one ID associated with the preconfiguration of the MG2. Support of preconfiguration of MGs in RRC signaling for PRS measurements: Each MG in the preconfiguration is associated with an ID | 27-11 | Yes |  | Using UL MAC CE to indicate measurement gap for PRS measurements to the gNB is not supported. | Per UE | No | No | No |  | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-11 | Support of DL MAC CE based MG activation request for PRS measurements | 1. Support of preconfiguration of MGs in RRC signaling for PRS measurements: Each MG in the preconfiguration is associated with an ID2. Support of using DL MAC CE to activate the MG for PRS measurements: The DL MAC CE for MG activation indicates the ID associated with the preconfigured MG |  | Yes |  | Using DL MAC CE to activate the preconfigured MG for PRS measurements is not supported | Per UE | No | No | No |  | Optional with capability signaling. |

### 3.3.10 Positioning in RRC\_INACTIVE 27-15, 27-15a, 27-16, 27-17, 27-18a, 27-18b, 27-18c, 27-19

**Proposal point 3.3.10-1: [for agreements] 27-15---27-19 are captured as**

**LPP TP:**

SRS-CapabilityPerBand-r16 ::= SEQUENCE {

 freqBandIndicatorNR-r16 FreqBandIndicatorNR-r16,

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

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

 ...,

 [[

 olpc-SRS-PosRRC-Inactive-r17 OLPC-SRS-Pos-r16 OPTIONAL, --27-16

 spatialRelationsSRS-Pos-r17 SpatialRelationsSRS-Pos-r16 OPTIONAL --27-19

 ]]

}

DL AOD, DL TDOA, Multi-RTT

 nr-DL-PRS-MeasRRC-Inactive-r17 ENUMERATED { supported } OPTIONAL, -- 27-18a, 27-18b, 27-18c,

 nr-DL-PRS-ProcessingRRC-Inactive-r17 ENUMERATED { supported } OPTIONAL, -- 27-17 FFS on whether location server need to know this;

**TS38.331 TP:**

BandNR ::= SEQUENCE {

--Skip unrelated parts;--

 [[

 enhancedSkipUplinkTxConfigured-v1660 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxDynamic-v1660 ENUMERATED {supported} OPTIONAL

 ]],

 [[

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

 txDiversity-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 srs-AllPosResourcesRRC-Inactive-r17 SRS-AllPosResourcesRRC-Inactive-r17 OPTIONAL, -- 27-15, 27-15a, FFS on LPP capability

 olpc-SRS-PosRRC-Inactive-r17 OLPC-SRS-Pos-r16 OPTIONAL, -- 27-16

 spatialRelationsSRS-PosRRC-Inactive-r177 SpatialRelationsSRS-Pos-r16 OPTIONAL --27-19

 ]]

}

~~SRS-AllPosResourcesRRC-Inactive-r17 ::= SEQUENCE {~~

 ~~srs-PosResourcesRRC-Inactive-r17 SRS-PosResources-r16,~~

 ~~srs-PosResourceSPRRC-Inactive-r17 SRS-PosResourceSP-r16 OPTIONAL~~

~~}~~

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

– *SRS-AllPosResourcesRRC-Inactive*

The IE *SRS-AllPosResourcesRRC-Inactive* is used to convey SRS positioning related parameters specific for a certain band.

***SRS-AllPosResourcesRRC-Inactive* information element**

-- ASN1START

-- TAG-SRS-ALLPOS-RESOURCESRRC-INACTIVE-START

SRS-AllPosResourcesRRC-Inactive-r17 ::= SEQUENCE {

 srs-PosResourcesRRC-Inactive-r17 SRS-PosResources-r16,

 srs-PosResourceSP-RRC-Inactive-r17 SRS-PosResourceSP-r16 OPTIONAL

}

--TAG-SRS-ALLPOS-RESOURCESRRC-INACTIVE-STOP

-- ASN1STOP

**TS38.306 TP :**

| ***spatialRelationsSRS-Pos-r16***Indicates whether the UE supports spatial relations for SRS for positioning. The capability signalling comprises the following parameters.- *spatialRelation-SRS-PosBasedOnSSB-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the serving cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on CSI-RS from the serving cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports any of DL PRS Resources for DL AoD, DL PRS Resources for DL-TDOA or DL PRS Resources for Multi-RTT defined in TS37.355 [22], or *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSRS-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SRS in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell. | Band | No | N/A | FR2 only |
| --- | --- | --- | --- | --- |
| ***spatialRelationsSRS-PosRRC-Inactive-r17***Indicates whether the UE supports spatial relations for SRS for positioning in RRC\_INACTIVE. The capability signalling comprises the following parameters.- *spatialRelation-SRS-PosBasedOnSSB-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the serving cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on CSI-RS from the serving cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports any of DL PRS Resources for DL AoD, DL PRS Resources for DL-TDOA or DL PRS Resources for Multi-RTT defined in TS37.355 [22], or *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSRS-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SRS in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnSSB-Serving-r16*. Otherwise, the UE does not include this field;- *spatialRelation-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports spatial relation for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *spatialRelation-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell. | Band | No | N/A | FR2 only |

| ***srs-AssocCSI-RS***Parameters for the calculation of the precoder for SRS transmission based on channel measurements using associated NZP CSI-RS resource (srs-AssocCSI-RS) as described in clause 6.1.1.2 of TS 38.214 [12]. UE supporting this feature shall also indicate support of non-codebook based PUSCH transmission.This capability signalling includes list of the following parameters:- *maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource;- *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs within a band simultaneously;*-* *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs within a band simultaneously. | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***srs-PosResourcesRRC-Inactive-r17***Indicates support of SRS for positioning in RRC\_INACTIVE. UE supporting this feature should also support open loop power control for positioning SRS based on SSB from the serving cell. The capability signalling comprises the following parameters:- *maxNumberSRS-PosResourceSetPerBWP-r16* Indicates the max number of SRS Resource Sets for positioning supported by UE per BWP*;*- *maxNumberSRS-PosResourcesPerBWP-r16* indicates the max number of SRS resources for positioning supported by UE per BWP, including periodic, semi-persistent, and aperiodic SRS;- *maxNumberSRS-ResourcesPerBWP-PerSlot-r16* indicates the max number of SRS resources configured by *SRS-Resource* and *SRS-PosResource-r16* supported by UE per BWP, including periodic, semi-persistent, and aperiodic SRS;- *maxNumberPeriodicSRS-PosResourcesPerBWP-r16* indicates the max number of periodic SRS resources for positioning supported by UE per BWP;- *maxNumberPeriodicSRS-PosResourcesPerBWP-PerSlot-r16* indicates the max number of periodic SRS resources for positioning supported by UE per BWP per slot. | Band | No | N/A | N/A |
| ***~~srs-PosResourceAP-r16~~***~~Indicates support of aperiodic SRS for positioning in RRC\_INACTIVE. The UE can include this field only if the UE supports~~ *~~srs-PosResources-r16~~*~~. Otherwise, the UE does not include this field. The capability signalling comprises the following parameters:~~~~-~~ *~~maxNumberAP-SRS-PosResourcesPerBWP-r16~~* ~~indicates the max number of aperiodic SRS resources for positioning supported by UE per BWP;~~~~-~~ *~~maxNumberAP-SRS-PosResourcesPerBWP-PerSlot-r16~~* ~~indicates the max number of aperiodic SRS resources for positioning supported by UE per BWP per slot.~~ | ~~Band~~ | ~~No~~ | ~~N/A~~ | ~~N/A~~ |
| ***srs-PosResourceSP-RRC-Inactive-r17***Indicates support of semi-persistent SRS for positioning in RRC\_INACTIVE. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field. The capability signalling comprises the following parameters:- *maxNumberSP-SRS-PosResourcesPerBWP-r16* indicates the max number of semi-persistent SRS resources for positioning supported by UE per BWP;- *maxNumberSP-SRS-PosResourcesPerBWP-PerSlot-r16* indicates the max number of semi-persistent SRS resources for positioning supported by UE per BWP per slot | Band | No | N/A | N/A |

| ***olpc-SRS-Pos-r16***Indicates whether the UE supports OLPC for SRS for positioning. The capability signalling comprises the following parameters.- *olpc-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports *NR-DL-PRS-ProcessingCapability-r16* defined in TS 37.355 [22], and *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *olpc-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell.- *maxNumberPathLossEstimatePerServing-r16* indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning per serving cell in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissios. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***olpc-SRS-PosRRC-Inactive-r17***Indicates whether the UE supports OLPC for SRS for positioning in RRC\_INACTIVE. The capability signalling comprises the following parameters.- *olpc-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports *NR-DL-PRS-ProcessingCapability-r16* defined in TS 37.355 [22], and *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;- *olpc-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *olpc-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell.- *maxNumberPathLossEstimatePerServing-r16* indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning per serving cell in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissios. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field. | Band | No | N/A | N/A |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27. NR\_pos\_enh | 27-15 | Support of positioning SRS transmission in RRC\_INACTIVE state for initial BWP | 1. Max number of SRS Resource Sets for positioning supported by UE2. Max number of [P/SP]SRS Resources for positioning3. Max number of [P/SP]SRS Resources for positioning per slot4. Max number of periodic SRS Resources for positioning 5. Max number of periodic SRS Resources for positioning per slotNote: OLPC for SRS for positioning based on SSB from the last serving cell (the cell that releases UE from connection) is part of this FG. No dedicated capability signaling is intended for this component |  | Yes |  |  | Per band | n/a | n/a | n/a | Component 1 candidate values: {1, 2, 4, 8, 12, 16}Component 2 candidate values: {1,2,4,8,16,32,64}Component 3 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}Component 4 candidate values: {1,2,4,8,16,32,64}Component 5 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}[Need for location server to know if the feature is supported]FFS: outside initial BWP | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-15a | Support of positioning SRS transmission in RRC\_INACTIVE state for initial BWP with semi-persistent SRS | 1. Max number of semi-persistent SRS Resources for positioning 2. Max number of semi-persistent SRS Resources for positioning per slot | 27-15 | Yes |  |  | Per band | n/a | n/a | n/a | Component 1 candidate values: {1,2,4,8,16,32,64}Component 2 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}[Need for location server to know if the feature is supported]FFS: outside initial BWP | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-16 | OLPC for positioning SRS in RRC\_INACTIVE state | Same asLPPOLPC-SRS-Pos-r16RRCOLPC-SRS-Pos-r16 |  | Yes |  |  | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported. | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-17 | Support of positioning in RRC\_INACTIVE state | Support of PRS processing in RRC\_INACTIVE | [13-1, 13-2, 13-3, 13-4] | FFS |  |  | FFS | FFS | FFS | FFS | [Need for location server to know if the feature is supported.]FFS: separate UE capability for location information reporting in RRC\_INACTIVE state using SDTNote: UE supporting this feature may support at least one from DL RSTD, DL PRS-RSRP, or UE Rx – Tx time difference measurement | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18a | Support of PRS measurement in RRC\_INACTIVE state for DL-TDOA | Support of PRS measurement in RRC\_INACTIVE state for DL-TDOA |  | FFS |  |  | FFS | FFS | FFS | FFS | [Need for location server to know if the feature is supported.]Note: Applicable for both UE-assisted and UE-based DL-TDOANote: PRS capabilities for DL-TDOA measurement and reporting described in FGs in 13-3, 13-3a, 13-3b, 13-6, 13-13 are the same for RRC Inactive. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18b | Support of PRS measurement in RRC\_INACTIVE state for DL-AoD | Support of PRS measurement in RRC\_INACTIVE state for DL-AoD |  | FFS |  |  | FFS | FFS | FFS | FFS | [Need for location server to know if the feature is supported.]Note: Applicable for both UE-assisted and UE-based DL-AoDNote: PRS capabilities for DL-AOD measurement and reporting described in FGs 13-2, 13-2a, 13-2b, 13-5, 13-13 are the same for RRC Inactive. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18c | Support of PRS measurement in RRC\_INACTIVE state for Multi-RTT | 1. Support of PRS measurement in RRC\_INACTIVE state for Multi-RTT[2. Support of positioning SRS transmission in RRC\_INACTIVE state] |  | FFS |  |  | FFS | FFS | FFS | FFS | [Need for location server to know if the feature is supported.]Note: PRS capabilities for Multi-RTT measurement and reporting described in FGs in 13-4, 13-4a, 13-4b, 13-11, 13-11a, 13-14 are the same for RRC Inactive | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-19 | Spatial relation for positioning SRS in RRC\_INACTIVE state | Same as*LPP**SpatialRelationsSRS-Pos-r16**RRC**SpatialRelationsSRS-Pos-r16* |  | Yes |  |  | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported. | Optional with capability signalling |

## 3.4 RAN4 feature lists 14-1

**Proposal point 3.4-1: [for agreements] 14-1 are captured as**

**TS38.331 TP:**

MeasAndMobParametersCommon ::= SEQUENCE {

 supportedGapPattern BIT STRING (SIZE (22)) OPTIONAL,

 ssb-RLM ENUMERATED {supported} OPTIONAL,

 ssb-AndCSI-RS-RLM ENUMERATED {supported} OPTIONAL,

 …,

 [[

 eventB-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFDD-TDD ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting ENUMERATED {supported} OPTIONAL

 ]],

 [[

 independentGapConfig ENUMERATED {supported} OPTIONAL,

 periodicEUTRA-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFR1-FR2 ENUMERATED {supported} OPTIONAL,

 maxNumberCSI-RS-RRM-RS-SINR ENUMERATED {n4, n8, n16, n32, n64, n96} OPTIONAL

 ]],

 [[

 nr-CGI-Reporting-ENDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 eutra-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 reportAddNeighMeasForPeriodic-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverParametersCommon-r16 SEQUENCE {

 condHandoverFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 nr-NeedForGap-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-Nronly-r16 BIT STRING (SIZE (10)) OPTIONAL,

 supportedGapPattern-Nronly-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberCLI-RSSI-r16 ENUMERATED {n8, n16, n32, n64} OPTIONAL,

 maxNumberCLI-SRS-RSRP-r16 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

 maxNumberPerSlotCLI-SRS-RSRP-r16 ENUMERATED {n2, n4, n8} OPTIONAL,

 mfbi-IAB-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NPN-r16 ENUMERATED {supported} OPTIONAL,

 idleInactiveEUTRA-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

 idleInactive-ValidityArea-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

 pcellT312-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-r16 BIT STRING (SIZE (2)) OPTIONAL

 ]],

 [[

 independentGapConfigPRS-r17 ENUMERATED {supported} OPTIONAL ]]

}

**TS38**.306 TP:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***independentGapConfig***This field indicates whether the UE supports two independent measurement gap configurations for FR1 and FR2 specified in clause 9.1.2 of TS 38.133 [5]. The field also indicates whether the UE supports the FR2 inter-RAT measurement without gaps when (NG)EN-DC is not configured. | UE | No | No | No |
| ***independentGapConfigPRS-r17***This field indicates for PRS measurement whether the UE supports two independent measurement gap configurations for FR1 and FR2 specified in clause 9.1.2 of TS 38.133 [5].  | UE | No | No | No |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability ignaling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 14. NR\_pos\_enh | 14-1 | per-FR MG for PRS measurement | Capability of supporting per-FR MG for PRS measurement | Rel-15 per-FR gap (independentGapConfig) | yes | no |  | Per UE | No | No | N/A |  | Optional with capability signalling |

# Summary report and proposals

# Open issues list for Positioning UE capabilities (R2-2202005)

**Table 3.7: open issue lists for UE positioning capability**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Topic** | **Open issues****Note:** Open Issues should be defined for aspects that need to be closed, important to make already agreed functionality work in a reasonable way. Not yet agreed optimizations that may not be needed shall not be listed as Open Issues. | **Related to the completion of WI?** **The topic has to be removed from Rel-17 scope if the corresponding open issues cannot be resolved.**  | **Remark**RAN1 provided updated UE feature list in R1-2200767; some are still open. | **Status** |
| **Latency reduction** | Scheduled location time UE capability |  | **Status**: draft in LPP running CR, check the status of LPP email discussion 116bis-628RAN2#116bis: Include the capability to support scheduled location in each method-ProvideCapabilities message, where 'method' can be any of the LPP positioning methods. The capability should indicate the time base(s) supported for scheduling location measurements.Pre117-e607Question2: Do comapies agree that it is necessary for the UE capability reporting for positioning methods that support multiple positioning modes to differentiate its UE capability of time based for different positioning modes? |  |
| Preconfigured ADUE capability/configuration limitationFFS the maximum number of preconfigured assistance data instances; | Yes | **Status**: check the status of LPP email discussion 116bis-628RAN2#116bis: Proposal 3.2.1.3-1 (modified): [Easy agreements] [10/10] Include the capability to support validity area in each method ProvideCapabilities message, where “method” can be any of the LPP positioning methods that rely on DL-PRS. FFS on other validity criteria.**Pre117-e607**Question6: Do companies agree that multiple AD instances can already be supported by the current LPP spec? |  |
| UE capabilities for MG enhancements | Yes | **Status**: check the status of RAN1 feature listRAN2 also needs to discuss how to capture UE capability based on RAN1 feature list ~~R1-2111810~~R1-2200767RRC:27-10, 27-11LPP:27-10a,  | Pre117-e612 based on RAN1 feature list |
| UE capabilities for PPW enhancements | Yes | **Status**: check the status of RAN1 feature listRAN2 also needs to discuss how to capture UE capability based on RAN1 feature list ~~R1-2111810~~R1-2200767RRC: 27-3-2, LPP: 27-3-3 | Pre117-e612 based on RAN1 feature list |
| On-Demand PRS | UE capability on On-Demand PRSFFS on per positioning method | Yes | **Pre117-e608****Q16 Do companies agree that the LMF may request UE-initiated on-demand PRS capability per positioning method, while the UE may similarly respond on its UE-initiated on-demand PRS capability per positioning method?****Q17 Companies are invited to provide their views on the following UE behaviour related to the reception of the on-demand PRS configuration index and whether it has an impact on the UE-initiated on-demand PRS capability:**1. **The UE may store a number of pre-defined on-demand PRS configurations until it is overridden by a new index of on-demand PRS configurations.**
2. **The number of pre-defined on-demand PRS configurations that a UE may store has an impact on the UE’s capability.**
 |  |
| RRC\_INACTIVE | UE capabilities on positioning in RRC\_INACTIVE in RAN1 feature lists27-6 DL PRS processing capabilities in RRC inactive state27-15 Support of positioning SRS transmission in RRC\_INACTIVE state [for initial BWP]27-16 OLPC for positioning SRS in RRC\_INACTIVE state27-17 Support of [PRS measurement in RRC\_INACTIVE]27-18a Support of PRS measurement in RRC\_INACTIVE state for DL-TDOA27-18b Support of PRS measurement in RRC\_INACTIVE state for DL-AoD27-18c Support of PRS measurement in RRC\_INACTIVE state for Multi-RTT27-19 Spatial relation for positioning SRS in RRC\_INACTIVE state | Yes | **Status:** check the status of RAN1 feature list and the discussion in R2-2201767;Follow RAN2 agreements “RRC state is transparent to LMF and no different handling on PRS for different RRC state”, RAN2 should avoid to optimize these aspects even if RAN1 agrees to introduce RRC\_INACTIVE specific LPP capabilities (27-6, 27-16, 27-17, 27-18a, 27-18b, 27-18c, 27-19).**RAN1 feature lists in** R1-2200767;FFS on LPP: 27-17, 27-18a, 27-18b, 27-18cFFS on RRC: 27-17, 27-18a, 27-18b, 27-18cLPP: 27-6Note from RAN1 on 27-6: Having the PRS processing capabilities in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state [, but instead LMF may set the response time assuming a specific RRC state during the PRS measurement and inform the gNB on the assumed RRC state, while the actual RRC state is still determined by UE/gNB that take the response time requirement and assumed RRC state into account.] | Pre117-e612 based on RAN1 feature list |
| UL capabilityWait for RAN1 decision on whether UL related RRC\_INACTIVE specific capabilities (27-15, 27-16, 27-19) should be captured in RRC or LPP. | Yes | **Status:** check the status of RAN1 feature list and the discussion in R2-2201767;**RAN1 feature lists in** R1-2200767;RAN1 has agreed:RRC: 27-15, 27-15a, FFS on LPP: 27-15, 27-15a,  | Pre117-e612 based on RAN1 feature list |
| GNSS Integrity | GNSS Integrity capability | Yes | **Status**: see the discussion in R2-2201767**Companies would like to wait for the outcome from GNSS integrity discussion.** | Pre117-e612**Discussion point 3.2.2-1: For GNSS integrity capability, do you agree capabilities captured in the running LPP CR R2-2201723?**  |
| RAN1 Led Item-Accuracy | Accuracy improvements-PRU | Yes | **Status** RAN2#116bisRAN2 will not discuss PRUs further without further guidance from RAN1 (LS or feature list).RAN1 did not provide capability on this in RAN1 feature list R1-2200767 |  |
|  | UE capability for Enhancements of information reporting from UE and gNB for multipath/NLOS mitigation  | Yes | **Status**: check the status of LPP email discussion 116bis-628, check the status of RAN1 feature list. Check RAN1 feature list R1-2200767; | Pre117-e612 based on RAN1 feature list |
|  | UE capability for Accuracy improvements by mitigating UE Rx/Tx and/or gNB Rx/Tx timing delays | Yes | **Status**: Discussion see R2-2201768. check the status of LPP email discussion 116bis-628, check the status of RRC email discussion 116bis-631Check RAN1 feature list R1-2200767;RRC: 27-1-2 | Pre117-e612 based on RAN1 feature list |
|  | UE capability for Accuracy improvements for DL-AoD positioning solutions | Yes | **Status**: Discussion see R2-2201768. check the status of LPP email discussion 116bis-628;Check RAN1 feature list R1-2200767; | Pre117-e612 based on RAN1 feature list |
| RAN4 feature list (Not listed in R2-2202005) | 14-1 per-FR MG for PRS measurement Capability of supporting per-FR MG for PRS measurement  |  | **Need to be captured;** | Pre117-e612 based on RAN4 feature list |

# Open issues list for Positioning UE capabilities (R2-2201722)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| R2-A1 | UE capabilities | Capabilities may need corrections based on RAN1/RAN4 input. | ProvideCapabilities | Rapporteur |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R2-B4 | Capability for scheduled location request | Differentiation between UE-based and UE-assisted support and indication of time bases supported. | OTDOA-ProvideCapabilities-->scheduledLocationRequest-r17A-GNSS-ProvideCapabilities-->scheduledLocationRequest-r17ECID-ProvideCapabilities-->scheduledLocationRequest-r17TBS-ProvideCapabilities-r13-->scheduledLocationRequest-r17Sensor-ProvideCapabilities-r13-->scheduledLocationRequest-r17WLAN-ProvideCapabilities-r13-->scheduledLocationRequest-r17BT-ProvideCapabilities-r13-->scheduledLocationRequest-r17NR-ECID-ProvideCapabilities-r16-->scheduledLocationRequest-r17NR-DL-TDOA-ProvideCapabilities-r16-->scheduledLocationRequest-r17NR-DL-AoD-ProvideCapabilities-r16-->scheduledLocationRequest-r17NR-Multi-RTT-ProvideCapabilities-r16-->scheduledLocationRequest-r17 | Huawei, vivo, Nokia**Pre117-e607**Question2: Do comapies agree that it is necessary for the UE capability reporting for positioning methods that support multiple positioning modes to differentiate its UE capability of time based for different positioning modes? |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R1-7 | Capability for 10ms Response Time | Do we need a capability for all methods? | ResponseTime --> unit-r15 --> ten-milli-seconds-r17 | Huawei(110)vivo(110) | Pre117-e612**Discussion point 3.2.1-1: For the finer granularity, which option do you prefer?** **Option 1** Finer granularity is only applied for NR RAT dependent positioning methods;**Option 2** Finer granularity is only applied for NR RAT dependent positioning methods and RAT independent positioning methods;**Option 3** Finer granularity is applied for LTE and NR RAT dependent positioning methods and RAT independent positioning methods; |

# Reference

1. R1-2200780 Rel17 RAN1 UE feature List
2. R4-2202400 (R4 feature list)
3. R2-2202005 Summary of postmeeting 634
4. R2-2201722\_([Post116bis-e][628][POS]37.355)\_summary
5. R2-2201723 LPP running CR