**3GPP TSG-RAN WG3 Meeting #111-e R3-211163**

**E-meeting, 25 Jan – 5 Feb 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.455** | **CR** | **0024** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **x** |

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|  | | | | | | | | | | |
| ***Title:*** | Including SRS frequency information in Positioning Information Request | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_POS-Core | | | | |  | ***Date:*** | | | 2021-01-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | LMF may request dedicated SRS at particular frequency band for UL positioning.  In Carrier Aggregation scenario, LMF may have preference on the frequency band of the SRS in order to request similar measurement from neighboring TRPs. This is important when a dedicated SRS for positioning purpose is requested.  In multi-RTT positioning scenario, the UL and DL measurements (UE RxTx and gNB RxTx) can only be made on the same band in Rel-16. The LMF needs to be able to request a SRS on the same carrier as available for DL PRS.  Impact assessment towards the previous version of the specification (same release):  This CR has isolated impact with the previous version of the specification (same release).  The impact can be considered isolated because the change only affects the requested SRS transmission. | | | | | | | | |
| ***R3-20*** | |  | | | | | | | | |
| ***Summary of change:*** | | Add the SRS frequency information in Requested SRS Transmission Characteristics | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | LMF cannot request SRS at particular frequency band, which may cause positioning failed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.2.27, 9.3.6, 9.3.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS/TR 38.473 CR 0725 | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: correct the semantics description of the new IE | | | | | | | | |

<<<<<<<<<<<<<<<<<<<< Changes Begin >>>>>>>>>>>>>>>>>>>>

### 9.2.27 Requested SRS Transmission Characteristics

This IE contains the requested SRS configuration for the UE for positioning purposes.

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| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description | Criticality | Assigned Criticality |
| Number Of Periodic Transmissions | C-ifResourceTypePeriodic |  | INTEGER (0..500,…) | The number of periodic SRS transmissions requested. The value of ‘0’ represents an infinite number of periodic SRS transmissions. |  |  |
| Resource Type | M |  | ENUMERATED (periodic, semi-persistent, aperiodic, …) |  |  |  |
| CHOICE *Bandwidth* | M |  |  |  |  |  |
| >FR1 |  |  | ENUMERATED (5kHz, 10kHz, 20kHz, 40kHz, 50kHz, 80kHz, 100kHz, ...) |  |  |  |
| >FR2 |  |  | ENUMERATED (50kHz, 100kHz, 200kHz, 400kHz,…) |  |  |  |
| **SRS Resource Set List** |  | *0.. 1* |  |  |  |  |
| **>SRS Resource Set Item** |  | *1..<* *maxnoSRS-ResourceSets>* |  |  |  |  |
| >>Number of SRS Resources Per Set | O |  | INTEGER (1..16,...) | The number of SRS Resources per resource set for SRS transmission. |  |  |
| >>**Periodicity List** |  | *0.. 1* |  |  |  |  |
| **>>>Periodicity List Item** |  | 1..<*maxnoSRS-ResourcePerSet*> |  |  |  |  |
| >>>>PeriodicitySRS | M |  | ENUMERATED (0.125, 0.25, 0.5, 0.625, 1, 1.25, 2, 2.5, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 160, 320, 640, 1280, 2560, 5120, 10240, …) | Milli-seconds |  |  |
| >>Spatial Relation Information | O |  | 9.2.34 |  |  |  |
| >>Pathloss Reference Information | O |  | 9.2.53 |  |  |  |
| SSB Information | O |  | 9.2.54 |  |  |  |
| SRS Frequency | O |  | INTEGER(0..3279165) | NR ARFCN  The carrier frequency of SRS transmission bandwidth. | YES | ignore |

|  |  |
| --- | --- |
| Condition | Explanation |
| ifResourceTypePeriodic | This IE shall be present if the *Resource Type* IE is set to the value "Periodic". |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoSRS-ResourceSets | Maximum no of requested SRS Resource Sets for SRS transmission. Value is 16. |
| maxnoSRS-ResourcePerSet | Maximum no of SRS Resources per set. Value is 16. |

<<<<<<<<<<<<<<<<<<<< Unchanged Text Omitted >>>>>>>>>>>>>>>>>>>>

IMPORTS

id-MeasurementQuantities-Item,

id-CGI-NR,

id-SFNInitialisationTime-NR,

id-GeographicalCoordinates,

id-ResultSS-RSRP,

id-ResultSS-RSRQ,

id-ResultCSI-RSRP,

id-ResultCSI-RSRQ,

id-AngleOfArrivalNR,

id-SRSSpatialRelation,

id-ResultNR,

id-ResultEUTRA,

maxCellinRANnode,

maxCellReport,

maxNrOfErrors,

maxNoMeas,

maxnoOTDOAtypes,

maxServCell,

id-OtherRATMeasurementQuantities-Item,

id-WLANMeasurementQuantities-Item,

maxGERANMeas,

maxUTRANMeas,

maxWLANchannels,

maxnoFreqHoppingBandsMinusOne,

id-TDD-Config-EUTRA-Item,

maxNrOfPosSImessage,

maxnoAssistInfoFailureListItems,

maxNrOfSegments,

maxNrOfPosSIBs,

maxnoPosMeas,

maxnoTRPs,

maxnoTRPInfoTypes,

maxNoOfMeasTRPs,

maxNoPath,

maxnoofAngleInfo,

maxnolcs-gcs-translation,

maxnoBcastCell,

maxnoSRSTriggerStates,

maxnoSpatialRelations,

maxNRMeas,

maxEUTRAMeas,

maxIndexesReport,

maxCellReportNR,

maxnoSRS-Carriers,

maxnoSCSs,

maxnoSRS-Resources,

maxnoSRS-PosResources,

maxnoSRS-ResourceSets,

maxnoSRS-ResourcePerSet,

maxnoSRS-PosResourceSets,

maxnoSRS-PosResourcePerSet,

maxPRS-ResourceSets,

maxPRS-ResourcesPerSet,

maxNoSSBs,

maxnoofPRSresourceSet,

maxnoofPRSresource,

id-Cell-ID,

id-TRPInformationTypeItem,

id-SrsFrequency

<<<<<<<<<<<<<<<<<<<< Unchanged Text Omitted >>>>>>>>>>>>>>>>>>>>

RequestedSRSTransmissionCharacteristics ::= SEQUENCE {

numberOfTransmissions INTEGER (0..500,...) OPTIONAL,

-- The IE shall be present if the Resource Type IE is set to “periodic” --

resourceType ENUMERATED {periodic, semi-persistent, aperiodic, ...},

bandwidth BandwidthSRS,

listOfSRSResourceSet SEQUENCE (SIZE (1.. maxnoSRS-ResourceSets)) OF SRSResourceSet-Item OPTIONAL,

sSBInformation SSBInfo OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { RequestedSRSTransmissionCharacteristics-ExtIEs} } OPTIONAL,

...

}

RequestedSRSTransmissionCharacteristics-ExtIEs NRPPA-PROTOCOL-EXTENSION ::= {

{ ID id-SrsFrequency CRITICALITY ignore EXTENSION SrsFrequency PRESENCE optional },

...

}

<<<<<<<<<<<<<<<<<<<< Unchanged Text Omitted >>>>>>>>>>>>>>>>>>>>

SRSConfiguration ::= SEQUENCE {

sRSCarrier-List SRSCarrier-List,

iE-Extensions ProtocolExtensionContainer { { SRSConfiguration-ExtIEs } } OPTIONAL,

...

}

SRSConfiguration-ExtIEs NRPPA-PROTOCOL-EXTENSION ::= {

...

}

SrsFrequency ::= INTEGER (0..3279165)

<<<<<<<<<<<<<<<<<<<< Unchanged Text Omitted >>>>>>>>>>>>>>>>>>>>

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--

-- IEs

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

id-Cause ProtocolIE-ID ::= 0

id-CriticalityDiagnostics ProtocolIE-ID ::= 1

id-LMF-UE-Measurement-ID ProtocolIE-ID ::= 2

id-ReportCharacteristics ProtocolIE-ID ::= 3

id-MeasurementPeriodicity ProtocolIE-ID ::= 4

id-MeasurementQuantities ProtocolIE-ID ::= 5

id-RAN-UE-Measurement-ID ProtocolIE-ID ::= 6

id-E-CID-MeasurementResult ProtocolIE-ID ::= 7

id-OTDOACells ProtocolIE-ID ::= 8

id-OTDOA-Information-Type-Group ProtocolIE-ID ::= 9

id-OTDOA-Information-Type-Item ProtocolIE-ID ::= 10

id-MeasurementQuantities-Item ProtocolIE-ID ::= 11

id-RequestedSRSTransmissionCharacteristics ProtocolIE-ID ::= 12

id-Cell-Portion-ID ProtocolIE-ID ::= 14

id-OtherRATMeasurementQuantities ProtocolIE-ID ::= 15

id-OtherRATMeasurementQuantities-Item ProtocolIE-ID ::= 16

id-OtherRATMeasurementResult ProtocolIE-ID ::= 17

id-WLANMeasurementQuantities ProtocolIE-ID ::= 19

id-WLANMeasurementQuantities-Item ProtocolIE-ID ::= 20

id-WLANMeasurementResult ProtocolIE-ID ::= 21

id-TDD-Config-EUTRA-Item ProtocolIE-ID ::= 22

id-Assistance-Information ProtocolIE-ID ::= 23

id-Broadcast ProtocolIE-ID ::= 24

id-AssistanceInformationFailureList ProtocolIE-ID ::= 25

id-SRSConfiguration ProtocolIE-ID ::= 26

id-MeasurementResult ProtocolIE-ID ::= 27

id-TRP-ID ProtocolIE-ID ::= 28

id-TRPInformationTypeList ProtocolIE-ID ::= 29

id-TRPInformationList ProtocolIE-ID ::= 30

id-MeasurementBeamInfoRequest ProtocolIE-ID ::= 31

id-ResultSS-RSRP ProtocolIE-ID ::= 32

id-ResultSS-RSRQ ProtocolIE-ID ::= 33

id-ResultCSI-RSRP ProtocolIE-ID ::= 34

id-ResultCSI-RSRQ ProtocolIE-ID ::= 35

id-AngleOfArrivalNR ProtocolIE-ID ::= 36

id-GeographicalCoordinates ProtocolIE-ID ::= 37

id-PositioningBroadcastCells ProtocolIE-ID ::= 38

id-LMF-Measurement-ID ProtocolIE-ID ::= 39

id-RAN-Measurement-ID ProtocolIE-ID ::= 40

id-TRP-MeasurementRequestList ProtocolIE-ID ::= 41

id-TRP-MeasurementResponseList ProtocolIE-ID ::= 42

id-TRP-MeasurementReportList ProtocolIE-ID ::= 43

id-SRSType ProtocolIE-ID ::= 44

id-ActivationTime ProtocolIE-ID ::= 45

id-SRSResourceSetID ProtocolIE-ID ::= 46

id-TRPList ProtocolIE-ID ::= 47

id-SRSSpatialRelation ProtocolIE-ID ::= 48

id-SystemFrameNumber ProtocolIE-ID ::= 49

id-SlotNumber ProtocolIE-ID ::= 50

id-SRSResourceTrigger ProtocolIE-ID ::= 51

id-TRPMeasurementQuantities ProtocolIE-ID ::= 52

id-AbortTransmission ProtocolIE-ID ::= 53

id-SFNInitialisationTime ProtocolIE-ID ::= 54

id-ResultNR ProtocolIE-ID ::= 55

id-ResultEUTRA ProtocolIE-ID ::= 56

id-TRPInformationTypeItem ProtocolIE-ID ::= 57

id-CGI-NR ProtocolIE-ID ::= 58

id-SFNInitialisationTime-NR ProtocolIE-ID ::= 59

id-Cell-ID ProtocolIE-ID ::= 60

id-SrsFrequency ProtocolIE-ID ::= xx

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