**3GPP TSG-RAN WG2 Meeting #131 *R2-2506330***

**Bangalore, India, 25th-29th Aug. 2025**

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **5478** | **rev** | **-** | **Current version:** | **18.6.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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|  |
| ***Title:***  | Introduction of multi-hop sidelink relay capability  |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_SL\_relay\_multihop-Core |  | ***Date:*** | 2025-09-01 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *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 canbe 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:*** | Introduce the new capabilities for multihop sidelink relay |
|  |  |
| ***Summary of change:*** | Two new UE capabilities with the corresponding pre-requisitie are added as below:* relayUE-MH-Operation-L2-r19
* remoteUE-MH-Operation-L2-r19
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|  |  |
| ***Consequences if not approved:*** | No UE capabilities for R19 multihop sidelink relay are defined |
|  |  |
| ***Clauses affected:*** | 6.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **x** |  |  Other core specifications  | TS/TR 38.306 CR 1334  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

####

### 6.3.3 UE capability information elements

START OF CHANGES

#### – *SidelinkParameters*

The IE *SidelinkParameters* is used to convey capabilities related to NR and V2X sidelink communications/positioning.

*SidelinkParameters* information element

-- ASN1START

-- TAG-SIDELINKPARAMETERS-START

SidelinkParameters-r16 ::= SEQUENCE {

 sidelinkParametersNR-r16 SidelinkParametersNR-r16 OPTIONAL,

 sidelinkParametersEUTRA-r16 SidelinkParametersEUTRA-r16 OPTIONAL

}

SidelinkParametersNR-r16 ::= SEQUENCE {

 rlc-ParametersSidelink-r16 RLC-ParametersSidelink-r16 OPTIONAL,

 mac-ParametersSidelink-r16 MAC-ParametersSidelink-r16 OPTIONAL,

 fdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

 tdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

 supportedBandListSidelink-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelink-r16 OPTIONAL,

 ...,

 [[

 relayParameters-r17 RelayParameters-r17 OPTIONAL

 ]],

 [[

 -- R1 32-x: Use of new P0 parameters for open loop power control

 p0-OLPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 pdcp-ParametersSidelink-r18 PDCP-ParametersSidelink-r18 OPTIONAL,

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

 sl-PRS-CommonProcCapabilityPerUE-r18 SEQUENCE {

 maxNumOfActiveSL-PRS-Resources-r18 SEQUENCE {

 fr1-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24} OPTIONAL,

 fr2-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128} OPTIONAL

 },

 maxNumOfSlotswithActiveSL-PRS-Resources-r18 SEQUENCE {

 fr1-r18 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL,

 fr2-r18 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

 }

 } OPTIONAL

 ]]

}

SidelinkParametersEUTRA-r16 ::= SEQUENCE {

 sl-ParametersEUTRA1-r16 OCTET STRING OPTIONAL,

 sl-ParametersEUTRA2-r16 OCTET STRING OPTIONAL,

 sl-ParametersEUTRA3-r16 OCTET STRING OPTIONAL,

 supportedBandListSidelinkEUTRA-r16 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF BandSidelinkEUTRA-r16 OPTIONAL,

 ...

}

RLC-ParametersSidelink-r16 ::= SEQUENCE {

 am-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 um-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

MAC-ParametersSidelink-r16 ::= SEQUENCE {

 mac-ParametersSidelinkCommon-r16 MAC-ParametersSidelinkCommon-r16 OPTIONAL,

 mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL,

 ...

}

UE-SidelinkCapabilityAddXDD-Mode-r16 ::= SEQUENCE {

 mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL

}

MAC-ParametersSidelinkCommon-r16 ::= SEQUENCE {

 lcp-RestrictionSidelink-r16 ENUMERATED {supported} OPTIONAL,

 multipleConfiguredGrantsSidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 drx-OnSidelink-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sl-LBT-FailureDectectionRecovery-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

MAC-ParametersSidelinkXDD-Diff-r16 ::= SEQUENCE {

 multipleSR-ConfigurationsSidelink-r16 ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimerSidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

BandSidelinkEUTRA-r16 ::= SEQUENCE {

 freqBandSidelinkEUTRA-r16 FreqBandIndicatorEUTRA,

 -- R1 15-7: Transmitting LTE sidelink mode 3 scheduled by NR Uu

 gnb-ScheduledMode3SidelinkEUTRA-r16 SEQUENCE {

 gnb-ScheduledMode3DelaySidelinkEUTRA-r16 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1,

 ms1dot25, ms1dot5, ms1dot75, ms2, ms2dot5, ms3, ms4,

 ms5, ms6, ms8, ms10, ms20}

 } OPTIONAL,

 -- R1 15-9: Transmitting LTE sidelink mode 4 configured by NR Uu

 gnb-ScheduledMode4SidelinkEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

BandSidelink-r16 ::= SEQUENCE {

 freqBandSidelink-r16 FreqBandIndicatorNR,

 --15-1

 sl-Reception-r16 SEQUENCE {

 harq-RxProcessSidelink-r16 ENUMERATED {n16, n24, n32, n48, n64},

 pscch-RxSidelink-r16 ENUMERATED {value1, value2},

 scs-CP-PatternRxSidelink-r16 CHOICE {

 fr1-r16 SEQUENCE {

 scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r16 SEQUENCE {

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-RxSidelink-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-2

 sl-TransmissionMode1-r16 SEQUENCE {

 harq-TxProcessModeOneSidelink-r16 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeOne-r16 CHOICE {

 fr1-r16 SEQUENCE {

 scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r16 SEQUENCE {

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 }

 },

 extendedCP-TxSidelink-r16 ENUMERATED {supported} OPTIONAL,

 harq-ReportOnPUCCH-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-4

 sync-Sidelink-r16 SEQUENCE {

 gNB-Sync-r16 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r16 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNSS-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-10

 sl-Tx-256QAM-r16 ENUMERATED {supported} OPTIONAL,

 --15-11

 psfch-FormatZeroSidelink-r16 SEQUENCE {

 psfch-RxNumber ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64},

 psfch-TxNumber ENUMERATED {n4, n8, n16}

 } OPTIONAL,

 --15-12

 lowSE-64QAM-MCS-TableSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --15-15

 enb-sync-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 --15-3

 sl-TransmissionMode2-r16 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r16 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r16 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-5

 congestionControlSidelink-r16 SEQUENCE {

 cbr-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

 cbr-CR-TimeLimitSidelink-r16 ENUMERATED {time1, time2}

 } OPTIONAL,

 --15-22

 fewerSymbolSlotSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --15-23

 sl-openLoopPC-RSRP-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --13-1

 sl-Rx-256QAM-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 ue-PowerClassSidelink-r16 ENUMERATED {pc2, pc3, pc5-v1820, spare5, spare4, spare3, spare2, spare1}

 OPTIONAL

 ]],

 [[

 --32-4a

 sl-TransmissionMode2-RandomResourceSelection-r17 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

 fr1-r17 SEQUENCE {

 scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r17 SEQUENCE {

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-Mode2Random-r17 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4b

 sync-Sidelink-v1710 SEQUENCE {

 sync-GNSS-r17 ENUMERATED {supported} OPTIONAL,

 gNB-Sync-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNSS-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4c

 enb-sync-Sidelink-v1710 ENUMERATED {supported} OPTIONAL,

 --32-5a-2

 rx-IUC-Scheme1-PreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5a-3

 rx-IUC-Scheme1-NonPreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5b-2

 rx-IUC-Scheme2-Mode2Sidelink-r17 ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64} OPTIONAL,

 --32-6-1

 rx-IUC-Scheme1-SCI-r17 ENUMERATED {supported} OPTIONAL,

 --32-6-2

 rx-IUC-Scheme1-SCI-ExplicitReq-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sharedSpectrumChAccessParamsSidelinkPerBand-r18 SharedSpectrumChAccessParamsSidelinkPerBand-r18 OPTIONAL,

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

 sl-PRS-CommonProcCapabilityPerBand-r18 SEQUENCE {

 maxSL-PRS-Bandwidth-r18 CHOICE {

 fr1-r18 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80, mhz100},

 fr2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 },

 maxNumOfActiveSL-PRS-ResourcesInOneSlot-r18 CHOICE {

 fr1-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24},

 fr2-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128}

 },

 maxNumOfSlotsWithActiveSL-PRS-Resources-r18 CHOICE {

 fr1-r18 ENUMERATED {n1, n2, n3, n4, n6, n8},

 fr2-r18 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64}

 },

 minTimeAfterEndofSlotCarryActiveSL-PRS-Resources-r18 ENUMERATED {ms20, ms30, ms40, ms50, ms80, ms100, ms160}

 } OPTIONAL,

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

 sl-PRS-RxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

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

 sl-PRS-RxInDedicatedResourcePool-r18 SEQUENCE {

 numOfSupportedRxPSCCH-PerSlot-r18 ENUMERATED {value1, value2},

 supportedCP-TypeFor60kHzSCS-r18 ENUMERATED {ncp, ncpAndECP}

 } OPTIONAL,

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

 sl-PRS-TxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

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

 sl-PRS-TxScheme1InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

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

 sl-PRS-TxScheme2InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-5: SL-PRS congestion control in a dedicated resource pool

 sl-PRS-CongestionCtrl-r18 ENUMERATED {cpt1, cpt2, cpt3} OPTIONAL,

 -- R1 41-1-8: Support of random selection in a dedicated resource pool

 sl-PRS-TxRandomSelection-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-10: Support of full sensing in a dedicated resource pool

 sl-PRS-TxUsingFullSensing-r18 ENUMERATED {value1, value2} OPTIONAL,

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

 sl-PRS-RxForBandWithSL-CA-r18 ENUMERATED {supported} OPTIONAL,

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

 sl-PRS-TxForBandWithSL-CA-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 47-s1: Transmission/Reception using dynamic resource pool sharing

 sl-DynamicSharingTxRx-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 47-v1: NR SL communication with SL CA

 sl-CA-Communication-r18 SEQUENCE {

 numberOfCarriers-r18 INTEGER (2..8),

 numberOfPSCCH-DecodeValueZ-r18 INTEGER (1..2),

 totalBandwidth-r18 ENUMERATED {mhz20,mhz30,mhz40,mhz50,mhz60,mhz70}

 } OPTIONAL,

 -- R1 47-v2: Synchronization for SL CA

 sl-CA-Synchronization-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 47-v3: PSFCH for SL CA

 sl-CA-PSFCH-r18 SEQUENCE {

 rx-PSFCH-Resource-r18 ENUMERATED {n5,n15,n25,n32,n35,n45,n50,n64,n100},

 tx-PSFCH-Resource-r18 ENUMERATED {n4,n8,n16,n24}

 } OPTIONAL,

 -- R4 45-2: SL reception in intra-carrier guard band

 sl-ReceptionIntraCarrierGuardBand-r18 ENUMERATED {supported} OPTIONAL

 ]],

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 -- R1 41-1-17: Open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated

 -- resource pool

 sl-PathlossBasedOLPC-SL-RSRP-Report-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

RelayParameters-r17 ::= SEQUENCE {

 relayUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-PathSwitchToIdleInactiveRelay-r17 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 relayUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-U2N-PathSwitchOperationL2-r18 ENUMERATED {supported} OPTIONAL,

 multipathRemoteUE-PC5L2-r18 ENUMERATED {supported} OPTIONAL,

 multipathRelayUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

 multipathRemoteUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMoreThanOneUuRLC-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-CADuplicationDirectpath-DRB-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-CADuplicationDirectpath-SRB-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMP-SplitDRB-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMP-SplitSRB-r18 ENUMERATED {supported} OPTIONAL,

 directpathRLF-RecoveryViaSRB1-r18 ENUMERATED {supported} OPTIONAL,

 splitDRB-WithUL-BothDirectIndirect-r18 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 relayUE-MH-Operation-L2-r19 ENUMERATED {supported} OPTIONAL,

 remoteUE-MH-Operation-L2-r19 ENUMERATED {supported} OPTIONAL

 ]]

}

PDCP-ParametersSidelink-r18 ::= SEQUENCE {

 pdcp-DuplicationSRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationDRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-SIDELINKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *SidelinkParametersEUTRA* field descriptions |
| ***sl-ParametersEUTRA1, sl-ParametersEUTRA2, sl-ParametersEUTRA3***This field includes IE of *SL-Parameters-v1430* (where *v2x-eNB-Scheduled-r14* and *V2X-SupportedBandCombination-r14* shall not be included), *SL-Parameters-v1530* (where *V2X-SupportedBandCombination-r1530* shall not be included) and *SL-Parameters-v1540* respectively defined in 36.331 [10]. It is used for reporting the per-UE capability for V2X sidelink communication. |

End OF CHANGES