**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 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:*** | | 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 | | | | | | | | |
|  | |  | | | | | | | | |
| ***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

]],

[[

-- 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