**3GPP TSG- Meeting #131 *R2-2506329***

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

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.306** | **CR** | **1334** | **rev** | **1** | **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   Meanwhile, the following agreements in RAN2#131 are captured:   * Keep relayUE-MH-Operation-L2 for both last relay UE and intermediate relay UE, while at least for intermediate relay UE, the remoteUE-MH-Operation-L2 is also indicated. Whether remote operation is a prerequisite for relay operation can be discussed in maintenance.     In addition, Annex presents multihop relay feature update for TR38.822. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No UE capabilities for R19 multihop sidelink relay are defined | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.16.1.1; A.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS/TR 38.331 CR 5478 | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | * Version 0:   R2-2505772 Introduction of multi-hop sidelink relay capability   * Endorsed in RAN2#131 | | | | | | | | |

#### 

START OF CHANGES

### 4.2.16 Sidelink Parameters

#### 4.2.16.1 Sidelink Parameters in NR

##### 4.2.16.1.1 Sidelink General Parameters

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD DIFF** | **FR1-FR2**  **DIFF** |
| --- | --- | --- | --- | --- |
| ***accessStratumReleaseSidelink-r16***  Indicates the access stratum release for NR sidelink communication the UE supports as specified in TS 38.331 [9]. | UE | Yes | No | No |
| ***multipathRelayUE-N3C-r18***  Indicates whether L2 multi-path relay UE operation using non-3GPP connection is supported by the UE. | UE | No | No | No |
| ***multipathRemoteUE-N3C-r18***  Indicates whether L2 multi-path remote UE operation using non-3GPP connection is supported by the UE. | UE | No | No | No |
| ***multipathRemoteUE-PC5L2-r18***  Indicates whether L2 multi-path remote UE operation using PC5 connection is supported by the UE. A UE supporting this feature shall also indicate support of *remoteUE-Operation-L2-r17.* | UE | No | No | No |
| ***pdcp-DuplicationMoreThanOneUuRLC-r18***  Indicates whether L2 multi-path remote UE supports PDCP duplication with more than one RLC entity over Uu interface in L2 multi-path relay. A UE supporting this feature shall also indicate support of *multipathRemoteUE-PC5L2-r18 or multipathRemoteUE-N3C-r18.* | UE | No | No | No |
| ***pdcp-CADuplicationDirectpath-DRB-r18***  Indicates whether L2 multi-path remote UE supports CA-based PDCP duplication over DRB using Uu interface in L2 multi-path relay. A UE supporting this feature shall also indicate support of *pdcp-DuplicationMoreThanOneUuRLC-r18*. | UE | No | No | No |
| ***pdcp-CADuplicationDirectpath-SRB-r18***  Indicates whether L2 multi-path remote UE supports CA-based PDCP duplication over SRB1/2 using Uu interface in L2 multi-path relay. A UE supporting this feature shall also indicate support of *pdcp-DuplicationMoreThanOneUuRLC-r18*. | UE | No | No | No |
| ***pdcp-DuplicationMP-SplitDRB-r18***  Indicates whether L2 multi-path remote UE supports PDCP duplication over split DRB in L2 multi-path relay. A UE supporting this feature shall also indicate support of *multipathRemoteUE-PC5L2-r18* or *multipathRemoteUE-N3C-r18*. | UE | No | No | No |
| ***pdcp-DuplicationMP-SplitSRB-r18***  Indicates whether L2 multi-path remote UE supports PDCP duplication over split SRB1/2 in L2 multi-path relay. A UE supporting this feature shall also indicate support of *multipathRemoteUE-PC5L2-r18* or *multipathRemoteUE-N3C-r18*. | UE | No | No | No |
| ***directpathRLF-RecoveryViaSRB1-r18***  Indicates whether L2 multi-path remote UE supports recovery from direct path RLF via split SRB1 using either PC5 connection or non-3GPP connection (if supported) in TS 38.331 [9]. | UE | No | No | No |
| ***posSIB-ForwardingSupported-r18***  Indicates whether the UE, when operating as an NR L2 sidelink relay UE, supports forwarding of posSIBs. The UE capable of operation as an NR L2 sidelink relay UE shall set this field to *supported* if it is capable of obtaining posSIBs. | UE | CY | No | No |
| ***relayUE-Operation-L2-r17***  Indicates whether NR L2 sidelink relay UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *supportedBandCombinationListSL-RelayDiscovery-r17*. | UE | No | No | No |
| ***relayUE-MH-Operation-L2-r19***  Indicates whether NR L2 multihop sidelink relay UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *relayUE-Operation-L2-r17*. | UE | No | No | No |
| ***relayUE-U2U-OperationL2-r18***  Indicates whether L2 U2U sidelink relay UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *supportedBandCombinationListSL-U2U-RelayDiscovery-r18.* | UE | No | No | No |
| ***remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18***  Indicates whether L2 multi-path remote UE supports indirect path addition or indirect path change with target relay UE in RRC\_IDLE or RRC\_INACTIVE state. A UE supporting this feature shall also indicate support of *multipathRemoteUE-PC5L2-r18* or *multipathRemoteUE-N3C-r18*. | UE | No | No | No |
| ***remoteUE-MH-Operation-L2-r19***  Indicates whether NR L2 multihop sidelink remote UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *remoteUE-Operation-L2-r17*. A UE acting as the intermediate relay UE also indicates support of this capability*.* | UE | No | No | No |
| ***remoteUE-Operation-L2-r17***  Indicates whether NR L2 sidelink remote UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *supportedBandCombinationListSL-RelayDiscovery-r17*. | UE | No | No | No |
| ***remoteUE-PathSwitchToIdleInactiveRelay-r17***  Indicates whether L2 sidelink remote UE supports direct to indirect path switch with target relay in RRC\_IDLE or RRC\_INACTIVE state. A UE supporting this feature shall also indicate support of *remoteUE-Operation-L2-r17*. | UE | No | No | No |
| ***remoteUE-U2N-PathSwitchOperationL2-r18***  Indicates whether enhanced NR L2 U2N remote UE operation for intra-gNB path switch and inter-gNB path switch including separate SL-RSRP and SD-RSRP threshold configurations for events X1 and X2 is supported by the UE. A UE supporting this feature shall also indicate support of *remoteUE-Operation-L2-r17.* | UE | No | No | No |
| ***remoteUE-U2U-OperationL2-r18***  Indicates whether L2 U2U sidelink remote UE operation is supported by the UE. A UE supporting this feature shall also indicate support of *supportedBandCombinationListSL-U2U-RelayDiscovery-r18.* | UE | No | No | No |
| ***sfn-DFN-OffsetSupported-r18***  Indicates whether the UE, when operating as an NR L2 sidelink relay UE, supports indication of the offset between SFN and DFN timelines. | UE | No | No | No |
| ***sl-PRS-CommonProcCapabilityPerUE-r18***  Indicates the common SL-PRS processing capability, and comprises the following parameters:  - *maxNumOfActiveSL-PRS-Resources-r18*: 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-r18*: 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.  A UE supporting this feature shall also support *sl-PRS-CommonProcCapabilityPerBand-r18*. | UE | No | No | No |
| ***splitDRB-WithUL-BothDirectIndirect-r18***  Indicates whether L2 multi-path remote UE supports UL transmission via both direct path and indirect path for split DRB. A UE supporting this feature shall also indicate support of *multipathRemoteUE-PC5L2-r18* or *multipathRemoteUE-N3C-r18*. | UE | No | No | No |

NEXT CHANGES

# A.4: Sidelink capabilities applicable to Uu and PC5

Annex A.4 specifies for each sidelink related capability, in which interface (i.e., *UECapabilityInformation* in Uu RRC and *UECapabilityInformation*Sidelink in PC5 RRC) a UE supporting sidelink shall report the concerned capability:

- *UECapabilityInformation*: the concerned sidelink capability is reported within *UECapabilityInformation*;

- *UECapabilityInformationSidelink*: the concerned sidelink capability is reported within *UECapabilityInformationSidelink;*

Table A.4-1: Sidelink capability reported in *UECapabilityInformation*/ *UECapabilityInformationSidelink*

|  |  |  |
| --- | --- | --- |
| Sidelink Parameter | *UECapabilityInformation* | *UECapabilityInformationSidelink* |
| accessStratumReleaseSidelink |  | X |
| outOfOrderDeliverySidelink |  | X |
| am-WithLongSN-Sidelink | X | X |
| um-WithLongSN-Sidelink | X | X |
| lcp-RestrictionSidelink | X |  |
| logicalChannelSR-DelayTimerSidelink | X |  |
| multipleSR-ConfigurationsSidelink | X |  |
| multipleConfiguredGrantsSidelink | X |  |
| supportedBandCombinationListSidelinkEUTRA-NR | X |  |
| supportedBandCombinationListSidelinkNR |  | X |
| gnb-ScheduledMode3SidelinkEUTRA | X |  |
| gnb-ScheduledMode4SidelinkEUTRA | X |  |
| sl-Reception | X | X |
| sl-TransmissionMode1 | X |  |
| sl-TransmissionMode2 | X |  |
| sl-TransmissionMode2-PartialSensing | X |  |
| sl-TransmissionMode2-RandomResourceSelection | X |  |
| sync-Sidelink | X |  |
| congestionControlSidelink | X |  |
| sl-Tx-256QAM | X | X |
| sl-Rx-256QAM | X | X |
| psfch-FormatZeroSidelink | X |  |
| lowSE-64QAM-MCS-TableSidelink | X | X |
| csi-ReportSidelink |  | X |
| enb-sync-Sidelink | X |  |
| rankTwoReception |  | X |
| fewerSymbolSlotSidelink | X |  |
| sl-openLoopPC-RSRP-ReportSidelink | X | X |
| rx-IUC-Scheme1-PreferredMode2Sidelink | X | X |
| rx-IUC-Scheme1-NonPreferredMode2Sidelink | X | X |
| rx-IUC-Scheme2-Mode2Sidelink | X | X |
| rx-IUC-Scheme1-SCI | X | X |
| tx-Sidelink | X |  |
| rx-Sidelink | X |  |
| ue-PowerClassSidelink | X |  |
| drx-OnSidelink | X | X |
| enhancedUuDRX-forSidelink | X |  |
| relayUE-Operation-L2 | X |  |
| remoteUE-Operation-L2 | X |  |
| remoteUE-PathSwitchToIdleInactiveRelay | X |  |
| supportedBandCombinationListSL-RelayDiscovery | X |  |
| supportedBandCombinationListSL-NonRelayDiscovery | X |  |
| rx-IUC-Scheme1-SCI-ExplicitReq | X | X |
| scheme2-ConflictDeterminationRSRP |  | X |
| tx-IUC-Scheme2-Mode2Sidelink | X | X |
| tx-IUC-Scheme1-Mode2Sidelink | X | X |
| rx-sidelinkPSFCH | X |  |
| p0-OLPC-Sidelink | X |  |
| sl-LBT-FailureDectectionRecovery | X |  |
| pdcp-DuplicationSRB-sidelink | X | X |
| pdcp-DuplicationDRB-sidelink | X | X |
| supportedBandCombinationListSL-U2U-RelayDiscovery | X |  |
| relayUE-U2U-OperationL2 | X |  |
| remoteUE-U2U-OperationL2 | X |  |
| remoteUE-U2N-PathSwitchOperationL2 | X |  |
| multipathRemoteUE-PC5L2 | X |  |
| multipathRelayUE-N3C | X |  |
| multipathRemoteUE-N3C | X |  |
| remoteUE-IndirectPathAddChangeToIdleInactiveRelay | X |  |
| pdcp-DuplicationMoreThanOneUuRLC | X |  |
| sl-ReceptionIntraCarrierGuardBand | X | X |
| sl-PowerClassUnlicensed |  | X |
| pdcp-CADuplicationDirectpath-DRB | X |  |
| pdcp-CADuplicationDirectpath-SRB | X |  |
| pdcp-DuplicationMP-SplitDRB | X |  |
| pdcp-DuplicationMP-SplitSRB | X |  |
| directpathRLF-RecoveryViaSRB1 | X |  |
| sl-DynamicChannelAccess | X |  |
| sl-DynamicMultiChannelAccess | X |  |
| sl-UE-COT-Sharing |  | X |
| sl-LBT-Option1 | X |  |
| sl-LBT-Option2 | X |  |
| sl-ResourceAllocMode1 | X |  |
| sl-Interlace-RB-TxRx | X |  |
| sl-PSFCH-MultiOccasion | X |  |
| sl-ContiguousRB-TxRx | X |  |
| sl-PSFCH-MultiContiguousRB | X | X |
| -PSFCH-MultiNonContiguousRB | X | X |
| sl-DynamicSharingTxRx | X |  |
| sl-CA-Basic | X | X |
| sl-CA-Synchronization | X |  |
| sl-MultiplePRB-CommonInterlacePSFCH | X |  |
| sl-PathlossBasedOLPC-SL-RSRP-Report | X | X |
| sl-PRS-CommonProcCapabilityPerUE | X |  |
| sl-PRS-CommonProcCapabilityPerBand | X |  |
| sl-PRS-RxInDedicatedResourcePool | X |  |
| sl-PRS-CongestionCtrl | X |  |
| sl-PRS-TxUsingFullSensing | X |  |
| sl-PRS-RxForBandWithSL-CA | X |  |
| sl-PRS-TxForBandWithSL-CA | X |  |
| sl-PRS-RxInSharedResourcePool | X |  |
| sl-PRS-TxInSharedResourcePool | X |  |
| sl-PRS-TxInSharedResourcePool | X |  |
| sl-PRS-TxScheme1InDedicatedResourcePool | X |  |
| sl-PRS-TxScheme2InDedicatedResourcePool | X |  |
| sl-PRS-TxRandomSelection | X |  |
| splitDRB-WithUL-BothDirectIndirect | X |  |
| relayUE-MH-Operation-L2 | X |  |
| remoteUE-MH-Operation-L2 | X |  |

End OF CHANGES

# Annex: Multihop sidelink relay capability updates for 38.822

### x.x.x NR\_SL\_relay\_multihop

**Table x.x.x-1: Layer-2 and Layer-3 feature list for NR\_SL\_relay\_multihop**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Field name in TS 38.331 [2]** | **Parent IE in TS 38.331 [2]** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Note** | **Mandatory/Optional** |
| x. NR\_SL\_relay\_multihop-Core | x-1 | Basic NR L2 multihop sidelink relay UE operation | Indicates whether NR L2 multihop sidelink relay UE operation is supported by the UE. | 31-3 | *relayUE-MH-Operation-L2-r19* | *RelayParameters-r17* | No | No |  | Optional with capability signalling |
| x-2 | Basic NR L2 multihop sidelink remote UE operation | Indicates whether NR L2 multihop sidelink remote UE operation is supported by the UE. | 31-4 | *remoteUE-MH-Operation-L2-r19* | *RelayParameters-r17* | No | No |  | Optional with capability signalling |