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

**E-Conference, 21st Feb. – 3rd March 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.306** | **CR** | **0696** | **rev** | **1** | **Current version:** | **16.7.0** |  |
|  |
| *For* [***HELP***](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:***  | 38.306 CR for sidelink relay UE capabilities |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_SL\_Relay-Core |  | ***Date:*** | 2022-01-23 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Introduction of R17 features on sidelink relay. |
|  |  |
| ***Summary of change:*** | UE capabilities for sidelink relay are defined. |
|  |  |
| ***Consequences if not approved:*** | No UE capabilities for sidelink relay are defined. |
|  |  |
| ***Clauses affected:*** | 4.2.16.1, 5.5, A4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS38.331 CR TBD |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*First change*

#### 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 |
| ***relayUE-Operation-L2-r17***Indicates whether basic NR L2 sidelink relay UE operation is supported by the UE. * Support both Uu and PC5 SRAP
* Support paging forwarding
* Support SIB forwarding
* Support to be target relay during indirect to direct path switch
* Support cell (re)selection/handover/Uu RLF indication to remote UE
 | UE | No | No | No |
| ***remoteUE-Operation-L2-r17***Indicate whether basic NR L2 sidelink remote UE operation is supported by the UE. If supported, this parameter indicates the support of the capabilities and includes the parameters as follows:* Support PC5 SRAP
* Support reception of paging from relay UE
* Support reception of SIB from relay UE
* Support RRC re-establishment via relay
* Support direct to indirect path switch with target relay in RRC\_CONNECTED state
* Support indirect to direct path switch
 | UE | No | No | No |
| ***remoteUE-PathSwitchToIdleInactiveRelay-r17***Indicate whether L2 sidelink remote UE supports direct to indirect path switch with target relay in RRC\_IDLE or RRC\_INACTIVE state. | UE | No | No | No |

*~~Editor’s Notes: RAN2 to down select whether the discovery capability is per UE or per band combination.~~*

*~~Editor’s Notes: It is FFS whether to introduce separate capability on Uu RSRP triggered relay discovery and/or PC5 RSRP triggered relay (re)selection.~~*

*~~Editor’s Notes: It is FFS whether to introduce separate feature capabilities beyond basic L2 relay/remote UE operation.~~*

*End of change*

*Second change*

##### 4.2.16.1.5 Other PHY parameters

| Definitions for parameters | Per | M | FDD-TDDDIFF | FR1-FR2DIFF |
| --- | --- | --- | --- | --- |
| ***supportedBandCombinationListSidelinkEUTRA-NR-r16***Defines the supported NR sidelink communication and/or V2X sidelink communication band combinations by the UE. A fallback band combination resulting from the reported sidelink band combination shall be supported by the UE. The UE does not include this field if the UE capability is requested by E-UTRAN (see TS 36.331 [17]) and the network request includes the field *eutra-nr-only*. | UE | No | No | No |
| ***supportedBandCombinationListSidelinkNR-r16***Defines the supported joint NR sidelink communication band combinations by the UE. A fallback band combination resulting from the reported sidelink band combination shall be supported by the UE. | UE | No | No | No |
| ***supportedBandListSidelink-r16***Indicates frequency bands supported for NR sidelink communications and parameters supported for each frequency band, as specified in 4.2.16.1.6. | UE | No | No | No |
| ***supportedBandCombinationListRelayDiscovery-r17*** Defines the supported band combinations of NR sidelink relay discovery message transmission and reception by the UE. If supported, this parameter indicates the support of the capabilities as follows:* It is common to L2 and L3 relay.
* it is common to remote UE and relay UE
 | UE | No | No | No |
| ***supportedBandCombinationListNonRelayDiscovery-r17*** Defines the supported band combinations of NR sidelink non-relay discovery message transmission and reception by the UE. | UE | No | No | No |

*End of change*

*Third change*

## 5.5 Sidelink Features

| Definitions for feature |
| --- |
| **Short-term time-scale TDM for in-device coexistence**It is optional for UE to support prioritization between LTE sidelink transmission/reception and NR sidelink transmission/reception.This field is only applicable if the UE supports at least one of *sl-Reception-r16*, *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16*, and if the UE supports V2X sidelink communication in the band combination. |
| **Rank 2 PSSCH transmission**It is optional for UE to support rank 2 PSSCH transmission. This field is only applicable if the UE supports *csi-ReportSidelink-r16* with *csi-RS-PortsSidelink* = p2. |
| **L3 sidelink relay UE operation**It is optional for UE to support L3 sidelink relay UE operation as specified in TS 38.331 [9]. |
| **L3 sidelink remote UE operation**It is optional for UE to support L3 sidelink remote UE operation as specified in TS 38.331 [9]. |

*End of change*

*Fourth change*

# 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 Uu) 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 |  |
| 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 |
| tx-Sidelink | X |  |
| rx-Sidelink | X |  |
| relayUE-Operation-L2 | X |  |
| remoteUE-Operation-L2 | X |  |
| remoteUE-PathSwitchToIdleInactiveRelay-r17 | X |  |
| supportedBandCombinationListRelayDiscovery | X |  |
| supportedBandCombinationListNonRelayDiscovery | X |  |

*~~Editor’s Notes: It is FFS whether relayUE-Operation-L2 and remoteUE-Operation-L2 are also indicated to peer UE.~~*

*End of change*

# Annex: RAN2 determined UE capabilities in the feature list format

Table X: Layer-2 and Layer-3 feature list for

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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.  | X-1 | Band combination list supporting transmission and reception of relay discovery | <To be added after R2 agreement> |  | *BandCombinationListSidelinkRelayDiscovery-r17* | *RF-Parameters* | No | No |  | Mandatory with capability signalling |
| X-2 | Band combination list supporting transmission and reception of non-relay discovery | <To be added after R2 agreement> |  | *BandCombinationListSidelinkNonRelayDiscovery-r17* | *RF-Parameters* | No | No |  | Mandatory with capability signalling |
| X-3 | Basic NR L2 sidelink relay UE operation | <To be added after R2 agreement> |  | *relayUE-Operation-L2-r17* | *SidelinkParametersNR-r16* | No | No |  | Mandatory with capability signalling |
| X-4 | Basic NR L2 sidelink remote UE operation | <To be added after R2 agreement> |  | *remoteUE-Operation-L2-r17*  | *SidelinkParametersNR-r16* | No | No |  | Mandatory with capability signalling |
| X-5 | Remote UE performs handover to idle/inactive relay UE | <To be added after R2 agreement> |  | *remoteUE-PathSwitchToIdleInactiveRelay-r17*  | *SidelinkParametersNR-r16* | No | No |  | Mandatory with capability signalling |