**3GPP TSG-RAN WG2 #116bis-e *R2-220xxxx***

**E-meeting, January 2022**

Agenda Item: 8.7.1

Source: OPPO

Title: Remaining Open issue list of R17 Sidelink Relay WI

Document for: Discussion, Decision

# Introduction

This is for the remaining open issues of R17 Sidelink Relay WI in RAN2.

# Discussion

# WID Scope

In RP-212819, the scope of the work item is described as follows:

The objective of this work item is to specify solutions to enable single-hop, sidelink-based, L2 and L3 based UE-to-Network (U2N) relaying.

Work Item objectives on aspects common to both L2 and L3:

1. Specify mechanisms for U2N **relay discovery and (re)selection** for L3 and L2 relaying [RAN2, RAN4]
   1. Re-use LTE relay discovery and (re)selection as baseline
2. Specify mechanisms for **Relay and Remote UE authorization** for L3 and L2 relaying [RAN3]
   1. Re-use LTE as baseline

Work Item objectives specific to Layer-2 (L2) relaying:

1. Specify mechanisms for E2E, i.e. PC5 and Uu, **QoS management** [RAN2]:
2. Specify mechanisms for **service continuity**
   1. Limited to intra-gNB cases [RAN2]
3. Specify mechanisms for U2N **Adaptation layer design** [RAN2]
   1. For bearer mapping and Remote UE identification, incl. RAN related security aspects if any
4. Specify **Control Plane procedures** for U2N, including RRC connection management, system information delivery, paging mechanism and access control for Remote UE [RAN2, RAN3]

Secondly, the objective of this work item also covers the non-relay discovery (i.e. 5G ProSe Direct Discovery).

1. Specify mechanisms for 5G ProSe Direct Discovery [RAN2, RAN3, RAN4];

# Open Issue list

### Objective-1/7: Relay discovery and (re)selection, Non-relay discovery

NOTE: The issues below may be applicable to non-relay discovery (O7) as well.

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| **Issue Index** | **Description** | **Suggested handling** | **Reason for add/remove this open issue** |
| O1.01 | [FFS point from R2#116 agreement] FFS if network can also configure a setting where both shared and dedicated pools can be used for SL discovery.. | Resolved and can be closed | Due to the following agreement made in RAN2 #116bis-e:  Proposal 1.1:[12/18] The use of both dedicated and shared resource pools for discovery transmission, when both pools have been configured, is not supported in this release.  We can remove this open issue |
| O1.02 | [FFS point from R2#116 agreement] LCP impact due to dedicated pool for discovery traffic. | Resolved and can be closed | Since we have the the following agreement:  Proposal 2.2: [18/19] For SL LCP procedure, only L2 destination IDs associated to discovery can be selected for grants from the dedicated discovery resource pool.  Proposal 2.3 (modified): [19/20] For SL LCP procedure, when the dedicated discovery pool is configured/used, only L2 destination IDs associated to communication can be selected for grants from the shared resource pool. When the dedicated resource pool is not configured/used, this restriction is not applied.  This open issue can be removed |
| O1.03 | [Open issue from tdoc R2-2200943] any impact to SUI message report due to the discovery and relay. | Pre117-e-offline | Since we have the following agreement:  Proposal 3.2:[19/20] SUI includes an indication of whether a particular destination L2 ID is associated to discovery.  This open issue is mostly resolved, there could be further details that are up to running-CR to handle, e.g.,  Proposal 5 (discussion) Regarding how to indicate L2 ID of remote UE in the SUI message by relay UE, RAN2 to down select the following options:  a. Option 1: add a new IE to carry L2 ID of remote UE  b. Option 2: reuse the existing field sl-DestinationIdentity to request TX resources, in addition, introduce an indicator indicating that the destination ID is for relay purpose |
| O1.04 | [FFS point from R2#116 agreement] Details on the new PC5-RRC signaling triggered by handover, Uu-RLF and cell (re)selection of relay UE | Resolved and can be closed | Since we have the following agreements:  Proposal 5: Upon reception of the PC5 RRC message for notification, it is up to remote UE implementation whether to release or keep the unicast PC5 link. And if remote UE decides to release the unicast PC5 link, it triggers the legacy L2 release procedure and performs relay reselection.  Proposal 6: For remote UE to make decision on whether to trigger relay （re）selection, the PC5-RRC notification message sent by relay UE includes the cause value, i.e., HO or cell (re)selection or Uu RLF.  This open issue can be removed. |
| Q1.05 | [FFS point from R2#116 agreement] How to differentiate a gNB that is relay-capable/relay-incapable and discovery-capable/discovery-incapable | Resolved and can be closed | Since we have the following agreements:  The UE can determine from SIB12 whether the gNB supports relay discovery and/or non-relay discovery. Details (including whether SIB12 signalling can differentiate between support of relay vs. non-relay discovery and whether the support is indicated explicitly or implicitly) can be discussed as part of stage 3 CR drafting.  Proposal 4.3: [18/19] Whether gNB supports L2 relay is explicitly indicated in SIB12.  Proposal 4.5: [18/19] No additional indication in SIB12 is required to signal that operation as a L3 relay is not allowed.  Whether L3 relaying support is signalled implicitly by indicating the support of discovery, or signalled independently from support of discovery, can be discussed in stage 3 drafting.  The left open issue is updated to O1.18 |
| O1.06 | [EN from running-CR of 38.322] The establishment and release for transmitting/receiving RLC entities for SL-SRB4 | CR rapporteur handled | Due to the following ENs in RLC running CR:  *Editor’s Note: FFS for RLC receiving entity establishment for SL-SRB4*  *Editor’s Note: FFS for transmitting/receiving RLC entities release for SL-SRB4*  We have the corresponding open issue |
| O1.07 | [EN from running-CR of 38.322] Whether/How to maintain RX\_Next\_Reassembly and RX\_Next\_Highest for SL-SRB4 | CR rapporteur handled | Due to the following ENs in RLC running CR:  *Editor’s Note: FFS for RX\_Next\_Reassembly for SL-SRB4*  *Editor’s Note: FFS for RX\_Next\_Highest for SL-SRB4*  We have the corresponding open issue |
| O1.08 | [EN from running-CR of 38.323] FFS for receiving PDCP\_entity\_establishment for SL-SRB4 | CR rapporteur handled | Due to the following ENs in PDCP running CR:  *Editor’s note: FFS for receiving PDCP entity establishment for SL-SRB4*  We have the corresponding open issue |
| O1.09 | [EN from running-CR of 38.323] FFS whether SL-SRB4 is a part of NR sidelink communication or new definition on sidelink relay discovery/non-relay discovery for SL-SRB4 is needed in PDCP spec | CR rapporteur handled | Due to the following ENs in PDCP running CR:  *Editor’s note: FFS whether SL-SRB4 is a part of NR sidelink communication or new definition on sidelink relay discovery/sidelink non-relay discovery for SL-SRB4 is needed.*  We have the corresponding open issue |
| O1.10 | [EN from running-CR of 38.323] FFS whether to define a separate PDCP Data PDU format for unicast SL-SRB4 | CR rapporteur handled | Due to the following ENs in PDCP running CR:  *Editor’s note: FFS whether to define a separate PDCP Data PDU format for unicast SL-SRB4*  We have the corresponding open issue |
| O1.11 | [EN from running-CR of 38.323 ]FFS for initial value for RX\_NEXT/RX\_DELIV for SL-SRB4 | CR rapporteur handled | Due to the following ENs in PDCP running CR:  *Editor’s Note: FFS for initial value for RX\_NEXT for SL-SRB4*  *Editor’s Note: FFS for initial value for RX\_DELIV for SL-SRB4*  We have the corresponding open issue |
| O1.12 | [EN from running-CR of 38.300] FFS if we use the term sidelink discovery, Non-Relay Discovery, or other term. | CR rapporteur handled | Due to the following EN in 38.300 running CR:  *Editor's Note: FFS if we use the term sidelink discovery, Non-Relay Discovery, or other terms.*  We have the corresponding open issue |
| O1.13 | [EN from running-CR of 38.304] Whether a new section should be created for NR sidelink discovery in 304 | CR rapporteur handled | Due to the following EN in 38.304 running CR:  *Editor’s Note: FFS whether a new section (i.e., Section 9) should be created for NR Sidelink discovery.*  We have the corresponding open issue |
| O1.14 | [EN from running-CR of 38.304] Whether remote and relay UE behaviour should be captured in section 8.2 in 304 | CR rapporteur handled | Due to the following EN in 38.304 running CR:  *Editor’s Note: FFS whether U2N Remote UE and/or U2N Relay UE behavior should be captured in this section.*  We have the corresponding open issue |
| O1.15 | [Open issue from tdoc R2-2201508] Whether the PC5-RRC indications (NotificationMessageSidelink message) applies to both L2 relay and L3 relay | Resolved and can be closed | Due to the the below agreement made:  Proposal 7: RAN2 confirm that the PC5-RRC message for notification is applied to both L2 and L3 relay This issue can be removed. |
| O1.16 | [Open issue from tdoc R2-2201508] FFS on the definition of out-of-coverage UE in RRC CR | CR rapporteur handled | Due to the proposal in R2-2201508 related 38.331 stage-3 open issue:  Proposal 8: Agree the update on 5.8.x3.3 Selection and reselection of NR sidelink U2N Relay UE in RRC running CR.  We have the corresponding open issue |
| O1.17 | [FFS point from R2#116b agreement] Whether L3 relaying support is signalled implicitly or explicitly in SIB12. | CR rapporteur handled | Due to the agreement made in RAN2 #116b:  Whether L3 relaying support is signalled implicitly by indicating the support of discovery, or signalled independently from support of discovery, can be discussed in stage 3 drafting.  We have the corresponding open issue |
| O1.18 | [FFS point from R2#116b agreement]FFS on detailed signalling to differentiate between support of relay vs. non-relay discovery in SIB12. | CR rapporteur handled | Due to the agreement made in RAN2 #116b:  The UE can determine from SIB12 whether the gNB supports relay discovery and/or non-relay discovery. Details (including whether SIB12 signalling can differentiate between support of relay vs. non-relay discovery and whether the support is indicated explicitly or implicitly) can be discussed as part of stage 3 CR drafting.  We have the corresponding open issue |
| O1.19 | [EN from running-CR of 38.321]Whether MAC procedure will be impacted to disallow multiplexing sidelink discovery and sidelink data | CR rapporteur handled | Due to the EN in 38.321 running CR:  *Editor’s Note: FFS if any MAC layer procedure is needed to disallow the multiplexing of Sidelink discovery and Sidelink Data in the same MAC PDU, or it can be safely assumed that upper layer has completely separated sidelink data and sidelink discovery messages with different Destinations.*  We have the corresponding open issue , yet considering the RAN2 agreement as follows, there should not be major left issue (if any) if SA2 confirm  Proposal 2.1: [17/19] RAN2 assumes that discovery and data transmitted by a UE cannot be multiplexed into the same TB because they are always associated to different destination L2 IDs. RAN2 sends this assumption in an LS to SA2.  Proposal 2.2: [18/19] For SL LCP procedure, only L2 destination IDs associated to discovery can be selected for grants from the dedicated discovery resource pool.  Proposal 2.3 (modified): [19/20] For SL LCP procedure, when the dedicated discovery pool is configured/used, only L2 destination IDs associated to communication can be selected for grants from the shared resource pool. When the dedicated resource pool is not configured/used, this restriction is not applied. |
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#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur Response |
| CATT | O1.04 | We are fine with the current PC5 RRC part. But wonder there are still some FFSs for the PC5-S part, right? | Pre117-e-offline | I cannot recall any FFS for PC5-S, can you elaborate more in a detailed way |
| Apple | A1.01 | Whether to include RRC state in PC5 discovery message for L2 relay.  As remote UE has an optional capability to support IDLE/INACTIVE relay (working assumption), in-coverage remote UE does not need to report measurement results for IDLE/INACTIVE relay candidates to gNB. Thus, it is better to include RRC state in the discovery message so that the remote UE can tell which relay(s) are to be measured for service continuity. | Pre117-e-offline | Rapp understand network can handle this based on remote UE capability, i.e. if the remote UE is in capable of IDLE/INACTIVE relay UE, gNB would not initiate path switch to the related relay UE. i.e., the RRC state in discovery message is not needed. So seems not a super critical issue to handle. |
| Qualcomm | O1.15 | This issue has been closed because we made below agreement:  Proposal 7: RAN2 confirm that the PC5-RRC message for notification is applied to both L2 and L3 relay. | Closed | Updated accordingly |
| Qualcomm | O1.04 | Agree with CATT. It is still not clear what is PC5-S message and its signalling details. And it is also not clear its relationship with PC5-RRC message (do we need duplicated functions?) | Pre117-e-offline | See response to CATT |
| Qualcomm | New | Below issue seems to be missed:  Proposal 10: RAN2 to discuss whether remote UE can perform autonomous relay reselection in other cases besides SL RLF, e.g. upon relay UE’s handover and relay UE’s RLF. | Pre117-e-offline | We understand the following agreement conclude on the issue:  For a L2 remote UE which is in RRC\_CONNECTED and has triggered the RRC connection re-establishment procedure, it is up to remote UE implementation to selects either a suitable relay UE or a suitable cell, i.e., no requirement for consideration of the cell ID of the relay UE. Otherwise, for a L2 remote UE which is in RRC\_CONNECTED and has not triggered the RRC connection re-establishment procedure, the usage of cell ID for the mobility of the remote UE is up to gNB implementation. |
| vivo | V1.01 | Which indication message to be sent (i.e. PC5-RRC or PC5-S) from relay UE to remote UE when HO/cell reselection/RLF happens to relay UE.  As we agree both PC5-S and PC5-RRC message to be used to inform remote UE about relay UE’s HO/Cell reselection/RLF, it should be clarified how the relay UE decides which one to send.  Alternatives can be e.g. based on the cause to send that message (e.g. when RLF the relay UE send PC5-S, which was discussed in RAN2 #116bis-e but not agreed), based on whether there is PC5-RRC connection (e.g. use PC5-RRC message when there is RRC connection and otherwise PC5-S), or Relay UE implementation. | Pre117-e-offline | From rapp’s view, the usage of PC5-S message is up to SA2/CT1 to specify, and R2 only specify the usage of PC5-RRC, for which the conclusion is clear already. |
| vivo | V1.02 | Remaining proposal in R2-2111382, about whether other cases for sending indication from relay UE to remote UE should be supported.  [12/19] Proposal 2: For the case when Uu RLF is recovered by relay UE, no new indication from relay UE to remote UE is introduced in Rel-17.  [14/19] Proposal 3-1: Relay UE Uu Recovery failure is not specified as a new case for the relay UE to send indication/message to remote UE.  [12/19] Proposal 3-2: Relay UE HO failure is not specified as a new case for the relay UE to send indication/message to remote UE.  [13/19] proposal 3-3: Relay UE Uu RRC reconfiguration failure is not specified as a new case for the relay UE to send indication/message to remote UE. | Pre117-e-offline | Rapp observe that majority view is not supported. Yet seems not necessary to include this issue. |
| vivo | V1.03 | Whether ***SL-CBR-PriorityTxConfigList*** or ***SL-CBR-CommonTxConfigList*** is used in discovery dedicated pool.  In dedicated pool for discovery, the pool configuration can be different to communication pool, as all the message in that pool is discovery and the priority is 1, so if the discovery message transmitting parameters are adjusted due to CBR, it can be considered whether the IE ***SL-CBR-PriorityTxConfigList*** or ***SL-CBR-CommonTxConfigList***is used in dedicated discovery pool configuration. | CR rapporteur handled | As recalled, the resource pool design will follow NR V2X principle, which implies that SL-CBR-PriorityTxConfigList will be used by default. |
| vivo | V1.04 | Multiplexing impacts.  For the following agreement, it is based on the assumption that L2 ID for data/discovery are surely to be different, but we are actually waiting for SA2 confirmation, and if they indicate that the L2 IDs can be the same, then we need to reconsider whether we support multiplexing of data/discovery.  This can be a ‘conditional’ open issue.  *Proposal 2.1: [17/19] RAN2 assumes that discovery and data transmitted by a UE cannot be multiplexed into the same TB because they are always associated to different destination L2 IDs. RAN2 sends this assumption in an LS to SA2.* | Pre117-e-offline (Conditional needed based on SA2 reply LS) | Seems related to O1.19 |

### Objective-3: QoS

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| **Issue Index** | **Description** | **Suggested handling** | **Reason for add/remove this open issue** |
| O3.01 | [Unhandled issue from Pre-R2#116b summary] FFS on further enhancement of L2 relay QoS to support flow control | Pre117-e-offline | Due to the proposal raised in QoS A.I. summary:  Proposal 1. RAN2 to discuss whether to support flow control in L2 U2N Relay.  We have the corresponding open issue  On the other hand, it is pending CB decision from 619  Proposal 1 (13/17) Control PDU is not supported in neither PC5 SRAP layer nor Uu SRAP layer in this release. |
| O3.02 | [Unhandled issue from Pre-R2#116b summary ]FFS on further enhancement of L2 relay QoS to support pre-emptive BSR | Pre117-e-offline | Due to the proposal raised in QoS A.I. summary  Proposal 2. RAN2 to discuss whether to support pre-emptive BSR transmission by a Relay UE to gNB.  We have the corresponding open issue |
| O3.03 | [Unhandled issue from Pre-R2#116b summary] FFS on further enhancement of L2 relay QoS to support bit rate recommendation | Pre117-e-offline | Due to the proposal raised in QoS A.I. summary  Proposal 3. RAN2 to discuss whether to support the bit rate recommendation procedure.  We have the corresponding open issue |
| O3.04 | [Unhandled issue from Pre-R2#116b summary] FFS on further enhancement of L2 relay QoS to support dedicated resources for relay traffic | Pre117-e-offline | Due to the proposal raised in QoS A.I. summary  Proposal 7. RAN2 to discuss the need of dedicated resources at Relay UE for relayed traffic.  We have the corresponding open issue |
| O3.05 | [Unhandled issue from Pre-R2#116b summary] FFS on QoS information report in SUI for SL discovery. | Pre117-e-offline | Due to the proposal raised in QoS A.I. summary  Proposal 5. RAN2 to discuss that UE does not need to report PC5 QoS information in SUI for SL discovery.  We have the corresponding open issue |
| O3.06 | [FFS point from R2#116 agreement] FFS signalling details for PC5 QoS configuration via Uu RRC signalling | CR rapporteur handled | Due to the following agreement made in RAN2 #116:  Proposal 2(20/21) (modified): [Easy] gNB directly configures relay UE for PC5 QoS configuration via Uu RRC signalling. And gNB also directly configures remote UE for PC5 QoS configuration via Uu RRC signalling. FFS signaling details.  We have the corresponding open issue |
| O3.07 | [EN from running CR of 38.321]whether to apply PDB restriction when performing MAC PDU transmission | CR rapporteur handled | Due to the following EN in 38.321 running CR:  *Editor’s Note: FFS the above change is needed, depending on “according to the associated priority” phrase is needed in Rel-16 specification.*  We have the corresponding open issue |

#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur response |
| CATT | O3.01 | For the suggested handling, it should be Pre117-e-offline. Today’s CB decision from 619 is just for adaptation layer, it is not related to the FFS in QoS. | Pre117-e-offline | OK to change |
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### Objective-4: Service Continuity

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| **Issue Index** | **Description** | **Suggested handling** | **Reason for add/remove this open issue** |
| O4.01 | [FFS point from R2#116b agreement] Confirm the working assumptions of supporting IDLE/INACTIVE relay UE in path switch. After confirmation, to further define how to configure the relay UE and remote UE for PC5 RLC bearer used for the forwarding of RRCReconfigurationComplete message in HO procedure of direct-to-indirect switch | Pre117-e-offline | Due to the following two WAs and proposal made in RAN2 #116b:  WA: The gNB can select a relay UE in any RRC state i.e., RRC\_IDLE/INACTIVE/CONNECTED as a target Relay UE when triggering the direct to indirect path switch procedure for the Remote UE by the Remote UE oriented solution, i.e. after receiving the path switch command, Remote UE establishes PC5 link with the Relay UE and sends HO complete message via the Relay UE which will trigger the Relay UE to enter CONNECTED state.  WA: UE capability for support by the remote UE of handover to idle/inactive UE.  PROPOSAL Recommendation based on majority (18/23)#3: For the delivery of RRCReconfigurationComplete message by the Remote UE, default configuration which can be reconfigured by the network same as SL-RLC1 is used for PC5 RLC channel configuration to support RRC\_IDLE/INACTIVE target Relay UE for direct to indirect path switch procedure.  We have the corresponding open issue |
| O4.02 | [FFS point from R2#116 agreement] Whether legacy PDCP behaviour can be reused for remote UE | Resolved and can be closed. | Due to the following agreement made in RAN2 #116:  No spec impact for ensuring UL PDCP lossless behaviour in indirect-to-direct path switch (assume it is a corner case or can be addressed by network implementation).  This open issue can be removed |
| O4.03 | [Unhandled issue from RAN2#116 At-meeting emails] Stopping condition of T304-like new timer for direct-to-indirect switching | Pre117-e-offline & CR rapporteur handled | Due to the proposal made in RAN2 #116 service continuity A.I.:  Proposal 14-2: FFS which option is taken as stop condition of the new T304-like timer in Remote UE:  ‐ Option1: Upon successfully sending RRCReconfigurationComplete (i.e., lower layer acknowledge is received from target relay);  ‐ Option2: Upon the PC5 unicast link is successfully established with the target Relay UE;  ‐ Option3: Upon reception of RRCReconfigurationCompleteSidelink message from target Relay UE;  ‐ Option4: Upon reception of an explicit indication from the target Relay UE.  We have the corresponding open issue |
| O4.04 | [FFS point from R2#116 agreement]Left issue on measure configuration and reporting (e.g., which ID to report for serving cell of relay UE (NCGI/NCI/PCI), allow/black-list configuration) | Resolved and can be closed. | Due to the following agreement made in RAN2 #116b:  Allow-list/block-list of relay UE during direct-to-indirect path switch is not introduced.  If RAN sharing is determined to be supported, relay UE’s cell ID included in measurement report is NCGI; otherwise it is NCI.  This open issue can be removed |
| O4.05 | [FFS point from R2#116 agreement] Confirm the working assumption to use reconfigurationWithSync to indicate direct-to-indirect path switch | CR rapporteur handled | Due to the working assumption made in RAN2#116：  Working assumption:  The existing reconfigurationWithSync is used to indicate direct-to-indirect path switch to Remote UE.  We have the corresponding open issue |
| O4.06 | [FFS point from R2#116 agreement]FFS on how to configure the threshold and use of SD-RSRP | Pre117-e-offline | Due to the following agreement made in RAN2 116:  Agreement:  Proposal 4 (modified): When SL-RSRP of the serving relay is not available, SD-RSRP is used as the SL measurement quantity. FFS how to measure SD-RSRP and if there would be a separate threshold for this case.  We have the corresponding open issue |
| O4.07 | [FFS point based on company input] How remote UE to handle the case that relay UE reselects to another cell after reporting and before path switch | Pre117-e-offline | Based on company input in this thread. |
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#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur response |
| Apple | A3.01 | How relay UE and gNB handling the Src L2 ID change issue in service continuity procedures (e.g, relay UE ID reporting) and how gNB to deal with Src L2 ID collision issue. | Pre117-e-offline | Rapp understand L2 ID update procedure is defined mainly for unicast link while for discovery message there is no such requirement. So not see it is a critical issue to handle at the current stage |
| Apple | A3.02 | How to configure the relay UE and remote UE for PC5 RLC bearer used for the forwarding of RRCReconfigurationComplete message in HO procedure of direct-to-indirect switch | Pre117-e-offline | Rapp tends to agree this issue needs to be solved, but assume this issue is related to O4.01, therefore, it will be included as part of O4.01 |
| Apple | A3.03 | When the new T304-like timer in Remote UE stops, the direct-to-indirect path switch may still fail because the IDLE/INACTIVE relay UE may still fail to establish the correct Uu hop of indirect path (e.g., due to cell reselection), How remote UE/gNB can identify and process this Handover failure? | Pre-117-e-offline | Rapp understand that is part of T304 design, i.e., it should be a complete story/design with no left issues, let’s handle that within O4.03. |
| vivo | O4.03 | Issue itself is fine. However, with the next meeting being the last meeting, stage-2 level discussion only is not sufficient. For example, it makes not no sense to only mention “i.e., lower layer acknowledge is received from target relay” as in the current Option 1. We need to make it crystal-clear what such lower layer Ack actually is, and whether any Spec impacts is expected for such operations (e.g. adding normative texts or just NOTE). Note that such details cannot be simply left to CR Rapp handling, as the issue on which layer to Ack involves functional aspect. | [Unhandled issue from RAN2#116 At-meeting emails] Stopping condition of T304-like new timer for direct-to-indirect switching (including all stage-3 details like which specific layer’s ACK is needed, which Spec impacts is expected, etc.) | See the point, will take that into consideration in pre-117 discussion planning. |
| vivo | O4.06 | Besides what the current issue includes, we think we need to clarify the intended behaviour on how the Remote UE measures SD-RSRP in CONNECTED, i.e. up to UE implementation, always measure or up to NW configuration. | [FFS point from R2#116 agreement] FFS on how to configure the threshold and use of SD-RSRP (including intended CONNECTED Remote UE behaviour on whether/when to measure SD-RSRP measurement, i.e. up to UE implementation, always measure or up to NW configuration) | Rapp understand the current description is general enough to cover the detailed issue(s) |
| Qualcomm | O4.03 | For vivo’s comment on what is lower layer acknowledgement, we think it is RLC ACK. Please note that RLC acknowledgement is always available because *RRCReconfigurationComplete* message is specified to use RLC AM in TS 38.331. |  |  |
| Qualcomm | New | We think a lot of issues on how to support relay UE in IDLE/INACTIVE state need to conclude in next RAN2 meeting:  1) How remote UE to handle the case that relay UE’s L2 ID has changed during the time gap b/w MR report and path switch execution  2) How remote UE to handle the case that relay UE reselects to another cell during the time gap  3) If relay UE failed to enter CONENCTED state upon reception of RRCReconfigurationComplete (e.g. rejected by target gNB), how remote UE and relay UE to handle it? What is the required signaling change?  4) If remote UE local ID is included in path switch command, then target UE is not aware of it when it receives the remote UE’s RRCReconfigurationComplete message with remote UE local ID in SRAP header (which is different from agreed RRC establishment procedure). How relay UE can handle this case?  For 1), 2), 3), even if majority prefer to treat it as corner case (although we disagree they are corner case), it indeed may happen. So, at least RAN2 need to specify corresponding failure handling behaviour. | Pre117-e-offline | Rapp assume the concern is on whether to confirm the WA in O4.01  For 1), see the reply to A3.01.  For 2), it seems not an issue applicable to IDLE/INACTIVE case only, and agree to add.  For 3), see reply to A3.03.  For 4), not sure about the issue yet, can you elaborate? |
| Qualcomm | New | We agreed that remote UE’s L2 ID is included in path switch command. However, in direct to indirect path switch, remote UE doesn’t report its L2 ID to gNB (current agreement is only relay UE to report its L2 ID), and so gNB can’t include its L2 ID in path switch command. We think some signaling gap is there. | Pre117-e-offline | We understand it is related to the SUI reporting issue in O5.08 |

### Objective-5: Adaptation Layer

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| **Issue Index** | **Description** | **Suggested handling** | **Reason for add/remove this open issue** |
| O5.01 | [FFS point from R2#116 agreement]Data PDU format for adaptation layer over Uu hop and PC5 hop. | Resolved and can be closed | Due to the following agreement and WA made in RAN2#116bis:  The size of remote UE Uu RB ID is of 5 bits in the adaptation layer header.  Remote local UE ID is 8 bits.  Remote UE ID is always present in PC5 adaptation layer header. RAN2 does not pursue procedural spec impact for handling it beyond P6 of R2-2200943. To be revisited this meeting in light of any conclusion on P6.  This open issue can be removed and updated to 02 and 03. |
| O5.02 | [Unhandled issue from RAN2#116b summary] Further RRC configuration details, e.g., the adaptation layer field configuration for remote UE, dependent on the field for PC5 hop | Resolved and can be closed. | Due to the agreement in RAN2 #116bis:  Remote UE obtains the local ID from the gNB via Uu RRC messages including RRCSetup/RRCReconfiguration/RRCResume/RRCReestablishment.  This open issue can be removed. |
| O5.03 | [Unhandled issue from RAN2#116b summary] Whether control PDU for adaptation layer is needed, and if yes, what is the format. | Resolved and can be closed | Due to the agreement made in RAN2 #116bis:  Proposal 1 (modified) Control PDU is supported in neither PC5 SRAP layer (13/19) nor Uu SRAP layer (14/19) in this release.  This open issue can be removed. |
| O5.04 | [FFS point from R2#116b agreement] Confirm the working assumption of length of remote local UE ID. | Pre117-e-offline | Due to the working assumption made in RAN2 #116b:  Working assumption:  Remote local UE ID is 8 bits.  We have the corresponding open issue. |
| O5.05 | [FFS point from R2#116b agreement] Confirm the working assumption of presenting remote UE ID in PC5 adaptation layer header. | Pre117-e-offline | Due to the working assumption made in RAN2 #116b:  Working assumption:  Remote UE ID is always present in PC5 adaptation layer header. RAN2 does not pursue procedural spec impact for handling it beyond P6 of R2-2200943. To be revisited this meeting in light of any conclusion on P6.We have the corresponding open issue. |
| O5.06 | [Unhandled issue from RAN2#116b summary] FFS on the configuration of LCID for PC5 RLC channel of Uu SRB0. | Resolved and can be removed | Due to the agreement made in RAN2 #116bis:  Agreements:  Proposal 3 (18/19) LCID for PC5 RLC channel is specified for remote UE Uu SRB0  This open issue can be removed. |
| O5.07 | [EN from running-CR of 38.351] The length of R-bit is to be decided. | CR rapporteur handled | Due to the following EN in 38.351 running CR:  Editor’s Note: The length of R-bit is to be decided.  We have the corresponding open issue |
| O5.08 | [FFS point from R2#116 agreement] SUI content to enable reporting the remote UE’s L2ID via SUI message to gNB | Pre117-e-offline | Due to the following agreement made in RAN2 #116:  Proposal 15 (modified): Relay UE is configured by gNB with the local/temp remote UE ID to be used in adaptation layer by RRCReconfiguration message, after reporting the remote UE’s L2ID via SUI message to gNB and before forwarding the first SRB0 UL message of the remote UE. FFS if impact to the SUI contents is needed to enable this.  We have the corresponding open issue.  Rapp understand it is a general issue on how to report remote UE ID in SUI |
| O5.09 | [EN from running-CR of 38.351] how for SRAP entity at Uu interface on U2N Relay UE, SRAP entity at PC5 interface on U2N Relay UE, and SRAP entity at PC5 interface on U2N Remote UE to handle error data. | CR rapporteur handled | Due to the following EN in 38.351 running CR:  Editor’s Note: how for SRAP entity at Uu interface on U2N Relay UE, SRAP entity at PC5 interface on U2N Relay UE, and SRAP entity at PC5 interface on U2N Remote UE to handle error data.  We have the corresponding open issue. |

#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur response |
| CATT | O5.06 | For the suggested handling part, I think it should be (pending CB decision,619 easy agreement), right? | (pending CB decision) | Updated accordingly |
| vivo | O5.06 | We already concluded how the PC5 LCID value for Uu SRB0 should be determined (specified). Then we can further discuss how the PC5 LCID for SRB1, SRB2 and DRBs should be configured, if this is not handled in the RRC running CR discussion. This is a left-over from Pre-116bs discussion, and two alternatives (for SRB2 and DRBs) are reusing gNB configuration as in Uu and reuse UE autonomous assignment as in R16 NR SL. SRB1 may be separately discussed, as it can sometimes use default configuration, sometimes use gNB configuration. | [Unhandled issue from RAN2#116b summary] FFS on the configuration of LCID for PC5 RLC channel of Uu SRB0SRB1, SRB2 and DRBs. | Reflected in O6.20 |
| Qualcomm | O5.06 | Agree with vivo’s comment. It has been captured as one of summary proposal:  [Proposal 10 (low priority) RAN2 to discuss whether the specified PC5 RLC channel for Uu SRB0 should be RLC UM mode.](#_Toc93052899)  [Proposal 11 (low priority) Regarding how to allocate LCID for PC5 RLC channel of remote UE Uu RBs including SRB2 and DRBs, RAN2 to down select the following options. FFS on SRB1](#_Toc93052900)  [a. Option 1:  allocated by UE same as in R16 SL](#_Toc93052901)  [b. Option 2: up to gNB dedicated configuration same as in Uu](#_Toc93052902) | Pre117-e-offline | Reflected in O6.20 |
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### Objective-6: CP Procedure

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| **Issue Index** | **Description** | **Suggested handling** | **Reason for add/remove this open issue** |
| O6.01 | [FFS point from R2#116 agreement]Uu RLC configuration for SRB0/1 message | Resolved and can be closed | Due to the agreement in 116b:  RAN2 not pursue default or fixed Uu RLC configuration for SRB0 messages and SRB1 messages of RRCReestablishment and RRCresume for remote UE, i.e. rely on network configuration.  This issue is solved and can be closed |
| O6.02 | [Unhandled issue from RAN2#116b summary]Detailed stage-3 signaling format on paging forwarding message from relay UE to remote UE | Resolved and can be cloased | Due to the agreement made in CP A.I. summary  Recommendation 2-1 [23/24]: Paging message is forwarded by relay UE to remote UE by sending only the complete PagingRecord relevant to that remote UE.  Recommendation 2-2 [18/24]: For Relay UE in RRC\_CONNECTED configured with paging CSS, RAN2 not pursue explicit signalling to indicate RRC-state of remote-UE. Further detail is left to RRC running-CR discussionThis issue can be removed. |
| O6.03 | [Unhandled issue from RAN2#116b summary] Cause value setting for relay UE access due to remote UE traffic | Pre-117-e-offline | Due to the proposal made in CP A.I. summary:  Recommendation 3-1: RAN2 further discuss to select between using existing or new cause value for relay UE to establish/resume an RRC connection due to a connection of remote UE, without introducing new AS-layer signalling from remote UE to relay UE.  We have the corresponding open issue |
| O6.04 | [Unhandled issue from RAN2#116b summary]Whether/how to support minimum/essential SI | Resolved and can be closed. | Due to the agreement made in RAN2 #116bis:  Recommendation 1-1a [19/23]: RAN2 not pursue new signalling from remote UE to relay UE to indicate the interested SI(s).  Recommendation 1-1b [19/23]: RAN2 not pursue short message forwarding from relay UE to remote UE.  Recommendation 1-1c (modified): For SIB-update in case of RRC\_IDLE/RRC\_INACTIVE remote UE(s), rely on relay UE to send updated SIB(s) to remote UE, no new signalling is to be introduced [17/23]. For SIB-update in case of RRC\_CONNECTED remote UE(s), rely on network to send updated SIB(s) when they are updated, no further restriction in specification [15/23]. Remote UE de-configure SI-request w.r.t relay UE implicitly when entering into RRC\_CONNECTED state [10/13].  Recommendation 1-2 [22/23]: For which discovery message to use to carry cellAccessRelatedInfo, rely on SA2 to decide which discovery message to use.  Recommendation 1-3 [19/23]: For SIB1, both request-based delivery (i.e., SIB1 request by the remote UE) and unsolicited forwarding are supported, of which the usage is left to relay UE implementation.  Recommendation 1-4 [20/23]: For SIB1, it is carried via PC5-RRC message of UuMessageTransferSidelink.  This open issue can be removed |
| O6.05 | [FFS point from R2#116 agreement] Handling of new T30x-like timers that used by SL-relay scenario | Resolved and can be closed | Due to the agreement made in RAN2 #116b:  For these timers, on top of existing stop conditions as for the legacy timers, add extra stop condition for relayed scenario, i.e., “the (re)selected relay becomes unsuitable” for T300-like timer, “relay (re)selection” for T319-like timer, and “the (re)selected relay becomes unsuitable” for T301-like timer. FFS whether the legacy stop-condition of “when the selected cell becomes unsuitable” is still applicable to T301.  The open issue can be removed. |
| O6.06 | [FFS point from R2#116b agreement] FFS on SIBs acquiring of remote UE when it is in RRC\_CONNECTED state. | Resolved and can be closed | Due to the agreement made in RAN2 #116bis：  Recommendation 1-3 [19/23]: For SIB1, both request-based delivery (i.e., SIB1 request by the remote UE) and unsolicited forwarding are supported, of which the usage is left to relay UE implementation.  Recommendation 1-4 [20/23]: For SIB1, it is carried via PC5-RRC message of UuMessageTransferSidelink.  This issue can be removed |
| O6.07 | [Unhandled issue from RAN2#116b summary] FFS on the way of C-RNTI value delivery. | Resolved and can be closed | Due to the agreement made in RAN2 #116bis:  Recommendation 4-1 [20/20]: Deliver C-RNTI value via RRC Release message with suspendConfig.This open issue can be closed |
| O6.08 | [Unhandled issue from RAN2#116b summary] FFS on how to support RAN sharing in RAN2. | Resolved and can be closed | Due to the agreement made in RAN2 #116bis:  Agreements:  [17/17] Proposal 1: cellAccessRelatedInfo from SIB1 is forwarded before PC5-RRC connection using discovery message for RAN sharing case. Same as non-RAN sharing case.  Proposal 2 (modified): RAN2 will have basic support of RAN sharing for L2 relay in Rel-17, without additional RAN2 spec impact beyond delivery of the PLMN list to the remote UE and use of the NCGI in measurement report (the latter as previously agreed at this meeting). RAN2 will not make additional investigations or spec changes wrt RAN sharing in Rel-17.  Proposal 3: Send LS to SA2 with RAN2 agreement on RAN sharing.  This open issue can be removed |
| O6.09 | [FFS point from R2#116 agreement] FFS on the signalling for the U2N Relay UE to determine to monitor POs for a U2N Remote UE in RRC\_CONNECTED state. | CR rapporteur handled. | Due to the agreement made in RAN2 #116 and RAN2 #116bis:  Recommendation 2-1 [23/24]: Paging message is forwarded by relay UE to remote UE by sending only the complete PagingRecord relevant to that remote UE.  Recommendation 2-2 [18/24]: For Relay UE in RRC\_CONNECTED configured with paging CSS, RAN2 not pursue explicit signalling to indicate RRC-state of remote-UE. Further detail is left to RRC running-CR discussion.  Recommendation 2-3 [20/23]: Use RRCReconfiguration for Network to carry paging message to the RRC\_CONNECTED relay UE in dedicated fashion.  We have the corresponding open issue. |
| O6.10 | [EN from running-CR of 38.304] U2N Relay UE behaviour on how to receive short messaage*(i.e., only in its POs or also on the POs of the U2N Remote UE)* | Resolved and can be closed. | Due to the agreement made in RAN2 #116bis:  Recommendation 1-1b [19/23]: RAN2 not pursue short message forwarding from relay UE to remote UE.  Recommendation 1-1c (modified): For SIB-update in case of RRC\_IDLE/RRC\_INACTIVE remote UE(s), rely on relay UE to send updated SIB(s) to remote UE, no new signalling is to be introduced [17/23]. For SIB-update in case of RRC\_CONNECTED remote UE(s), rely on network to send updated SIB(s) when they are updated, no further restriction in specification [15/23]. Remote UE de-configure SI-request w.r.t relay UE implicitly when entering into RRC\_CONNECTED state [10/13].  This open issue can be removed. |
| O6.11 | [EN from running-CR of 38.304] Whether to capture SIB forwarding by the U2N Relay UE upon reception of short message. | Resolved and can be closed | Due to the agreement made in RAN2 #106bis:  Recommendation 1-3 [19/23]: For SIB1, both request-based delivery (i.e., SIB1 request by the remote UE) and unsolicited forwarding are supported, of which the usage is left to relay UE implementation.  This open issue can be removed |
| O6.12 | [Open issue from tdoc R2-2201508] FFS on the configuration of Uu RLC bearer for relaying service | CR rapporteur handled | Due to the proposal in R2-2201508 related 38.331 stage-3 open issue:  Proposal 1: RAN2 to select one alternative to configure Uu RLC bearer for relaying service (i.e. the bearers associated with Uu SRAP):  ‐ Option 1: reusing existing RLC-BearerConfig, by handling the servedRadioBearer as   1a: modifying the condition as NW will only configure the field to a configured SRB or DRB i.e. non-relaying RLC channel.   1b: L2 U2N Relay UE ignoring the field.  ‐ Option 2: introducing new RLC configuration.  We have the corresponding open issue |
| O6.13 | [Open issue from tdoc R2-2201508] FFS on the terminology of Uu/PC5 RLC channel would be used for L2 U2N Relay operation. | CR rapporteur handled | Due to the proposal in R2-2201508 related 38.331 stage-3 open issue:  Proposal 2: The terminology of Uu/PC5 RLC channel would be used for L2 U2N Relay operation.  We have the corresponding open issue. |
| O6.14 | [Open issue from tdoc R2-2201508] FFS on the handling of *useT312* | Pre117\_e offline | Due to the proposal in R2-2201508 related 38.331 stage-3 open issue:  Proposal 3: useT312 can be configured to event Y (on condition that no other spec impact), but cannot be configured to event X.  We have the corresponding open issue. |
| O6.15 | [Open issue from tdoc R2-2201508 ]FFS on whether to use the same message (Remote InformationSidelink) for SIB request and Paging information provision, and same message (UuMessageTransferSidelink) for SIB forwarding and Paging delivery | CR rapporteur handled | Due to the proposal in R2-2201508 related 38.331 stage-3 open issue:  Proposal 4: RAN2 to confirm that the same message (RemoteInformationSidelink) is used for SIB request and Paging information provision.  Proposal 5: RAN2 to confirm that the same message (UuMessageTransferSidelink) is used for SIB forwarding and Paging delivery.  I.e., the following Editor Notes in running CR 38.331 should be addressed.  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging information and SIB request at later meetings.*  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging and SIB forwarding at later meetings.*  We have the corresponding open issue. |
| O6.16 | [FFS point from R2#116 agreement] FFS value and name for T300-like, T301-like, T319-like | CR rapporteur handled | Due to the agreement made in RAN2 #116:  Proposal 17: Remote UE uses different timers (FFS: value and/or name) for access (T300-like), resume (T319-like) and re-establishment (T301-like) compared to those for legacy Uu procedures [23/23]  We have the corresponding open issue. |
| O6.17 | [Unhandled issue from RAN2#116b summary]Whether network use RRCReconfiguration, to carry remote UE paging message to the RRC\_CONNECTED relay | Resolved and can be closed | Due to the agreement made in RAN2 #116bis:  Recommendation 2-3 [20/23]: Use RRCReconfiguration for Network to carry paging message to the RRC\_CONNECTED relay UE in dedicated fashion.This open issue can be removed |
| O6.18 | [Unhandled issue from comment]Spec impact on SI delivery and Paging for remote UE | CR rapporteur handling | Suggested from company feedback:  For SI delivery and Paging of Remote UE, the following Editor Notes in running CR 38.331 should be addressed.  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging information and SIB request at later meetings.*  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging and SIB forwarding at later meetings.* |
| O6.19 | [Unhandled issue from comment]Whether to include PCI in suspendconfig | Pre117-e-offline | Based on the agreement  Recommendation 4-1 [20/20]: Deliver C-RNTI value via RRC Release message with suspendConfig.  Rapp understand it is reasonable to align for PCI as well |
| O6.20 | [Unhandled issue from RAN2#116b summary] FFS on the configuration of LCID for PC5 RLC channel of Uu SRB0SRB1, SRB2 and DRBs. | Pre117-e-offline | To address the following left issue from pre-116b summary  Proposal 11 (low priority) Regarding how to allocate LCID for PC5 RLC channel of remote UE Uu RBs including SRB2 and DRBs, RAN2 to down select the following options. FFS on SRB1  a. Option 1: allocated by UE same as in R16 SL  b. Option 2: up to gNB dedicated configuration same as in Uu |
| O6.21 | [Unhandled issue due to comment]Whether SRAP configuration can be stored as AS context | Pre117-e-offline | Due to company feedback |

#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur response |
| CATT | O6.09 | I think the CB decision is just related to relay UE in RRC\_CONNECTED. But for latter FFS part(and for the case of idle/inactive relay UE. [18/23]), we still need further discussion, right? | Pre117\_e offline | do not get the point: for IDLE/INACTIVE relay UE, it has no choice but to monitor paging for the remote UE. Do not see the left issue yet. |
| vivo | V6.01 | RAN2 to discuss the RRC Release procedure of Remote UE or Relay UE.  To align with SA2 ( 6.5.2.1.2 of TS 23.304), it should be guaranteed that when the Remote UE is released to RRC IDLE or RRC INACTIVE, the PC5 link is kept i.e., should not be released by the NW. | Handle by Pre117-e-offline. | Do not see the left issue for R2, i.e., S2 tend to leave it to UE implementation to “When the 5G ProSe Remote UE is in CM-IDLE state, it may either release the PC5 link for relaying or not.”, and R2 spec is compatible with that implementation. |
| vivo | V6.02 | For relay specific link, RAN2 to discuss whether and how to use Rel-16 *RRCReconfigurationSidelink* message/procedure (with the following fields) by Remote UE or Relay UE. Confirm if there is any specification impact.  - *sl-MeasConfig* - *sl-CSI-RS-Config* - *sl-LatencyBoundCSI-Report*  - *slrb-ConfigToAddModList* - *slrb-ConfigToReleaseList* - *sl-ResetConfig* | Handle by Pre117-e-offline. | Rapp understand this is quite stage-3 details and the key issue is LCID handling which has been included. |
| vivo | V6.03 | For SI delivery and Paging of Remote UE, the following Editor Notes in running CR 38.331 should be addressed.  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging information and SIB request at later meetings.*  *Editor’s note: Updates would be needed if it is conclude two separate messagas for paging and SIB forwarding at later meetings.* | Handle by Pre117-e-offline. | Already covered in O6.15 |
| Qualcomm | New | It is not clear whether Adaptation layer related configuration is stored as remote UE’s Inactive AS context.  And it is not clear whether Adaptation layer related configuration is stored as relay UE’s Inactive AS context. | Pre117\_e offline |  |
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### UE Capability

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| Issue Index | Description | Suggested handling | Reason to add/remove the issue |
| O7.01 | [FFS point from R2#116bis] whether to introduce separate capability on Uu RSRP triggered relay discovery and/or PC5 RSRP triggered relay (re)selection. | Pre117-e-offline | Due to the agreement made in RAN2 #116bis:  Proposal 2 (15/16): As baseline, the NR discovery capability is common to relay and non-relay discovery. FFS whether to introduce separate capability on Uu RSRP triggered relay discovery and/or PC5 RSRP triggered relay (re)selection.  We have the corresponding open issue. |
| O7.02 | [FFS point from R2#116bis] whether also introduce separate feature capabilities beyond basic operation. | Pre117-e-offline | Due to the agreement made in RAN2 #116bis:  Proposal 6 (17/17): For L2 relay, introduce separate capability signaling for basic remote UE operation and basic relay UE operation where “basic operation” means essential functions to enable L2 relay. FFS whether also introduce separate feature capabilities beyond basic operation.  We have the corresponding open issue. |
| O7.03 | [FFS point from R2#116bis] For L2 relay, the capability signaling for basic remote UE operation and basic relay UE operation are indicated to gNB (i.e., included in UECapabilityInformation). FFS whether also indicated to peer UE. | Pre117-e-offline | Due to the agreement made in RAN2 #116bis:  For L2 relay, the capability signaling for basic remote UE operation and basic relay UE operation are indicated to gNB (i.e., included in UECapabilityInformation). FFS whether also indicated to peer UE.  We have the corresponding open issue. |
| O7.04 | [FFS point from R2#116bis]FFS on basic capability signalling for NR sidelink discovery | Pre117-e-offline | Due to the agreement made in RAN2 #116bis:  Proposal 4 (modified): RAN2 will down select between the following two alternatives on baseline capability signaling of NR discovery:  • Option 1 (9/16): A list of band combination list, which is similar to Rel-16 sidelink communication band combination list (i.e., supportedBandCombinationListSidelink-r16)  • Option 2 (7/16): A single bit on whether supporting NR discovery  We have the corresponding open issue |

#### Company input table

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| Company | Issue Index | Description | Suggested handling | Rapporteur response |
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# Reference

1. RP-212819, revised WID on SL Relay, OPPO, CMCC