**3GPP TSG-** **RAN2 Meeting #119-bis electronic R2-221xxxx**

**Online, 10th – 19th Oct 2022**

**Agenda item:** 6.7.1

**Title:** Report of [AT119bis-e][414][Relay] Rel-17 relay RRC CR (Huawei)

**Source:** Huawei, HiSilicon

**Document for:** Discussion and decision

1. Introduction

This is the report of the following offline discussion.

* [AT119bis-e][414][Relay] Rel-17 relay RRC CR (Huawei)

 Scope: Check the rapporteur CR in R2-2210493, consider related proposals on RRC, and merge in decisions of this meeting. Checkpoint at Rel-17 CB second week; discussion can be extended for merging of the CR.

 Intended outcome: Agreeable CR

 Deadline: Friday 2022-10-14 1000 UTC (for initial checkpoint)

2. Discussion

In Monday session, the following proposals in R2-2210890 ([Pre119bis-e][401] Summary of AI 6.7.2.2 on relay control plane) are left to [414].

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| RLC handling:[To be discussed] Proposal 2.2: RAN2 to discuss if the default SL\_RLC1 configuration is used to establish Rx RLC channels for SRB1 messages without Tx UE’s indication, or to adopt PC5-RRC from Tx to Rx for the default SL\_RLC1 configuration. [UEs need to align the understanding]To be handled in email discussion [414] |

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| [To be discussed] Proposal 13: RAN2 confirms that each PC5 Relay RLC channel configuration provided by network to Relay UE is uniquely associated with one Remote UE. [NW and UEs need to align the understanding]To be further discussed in email discussion [414]. |

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| Others：[To be discussed] Proposal 8: RAN2 confirms for sidelink discovery reception the remote UE also needs to check remote UE AS-layer condition. [No inter-operability issue][To be discussed] Proposal 10: RAN2 to discuss whether to clarify in AS specifications that emergency services/limited service level is not supported by remote UE in Rel-17. [No inter-operability issue][To be discussed] Proposal 12: RAN2 to discuss the change in R2-2210170, i.e. “if T301 and T304 is are not running, initiate the RRC connection re-establishment procedure as specified in 5.3.7”. [No inter-operability issue]P8/P10/P12 to be discussed in email discussion [414]. |

In addition, the P2 in R2-2210777 (Summary of AI 6.7.2.4 on discovery and reselection) is left to [414] as well.

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| Proposal 2: Merge R2-2209894 into RRC rapporteur’s discussion for further discussion. |

Therefore, in this offline discussion some questions are given on the following aspects to further collect companies’ views.

## 2.1 AS-layer condition for discovery reception

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| **TDoc number** | TDoc title | Source | Proposals | Rapporteur’s comment |
| [**R2-2209377**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119bis-e/Docs/R2-2209377.zip) | Correction for U2N Relay | OPPO | 3. In 5.8.3.2, remove the relay/remote UE AS-layer condition for relay discovery reception, to align with 5.8.13.2 | The intention is to align the descriptions in RRC as well as TS 38.304, to say there is no need to check remote UE AS-layer condition for sidelink discovery reception. However the issue is if remove remote UE AS condition for discovery reception, it seems there is no way to control a UE being a remote UE in Model A (annouce and monitor). The other way to align 5.8.13.2 is to add the AS condition in 5.8.13.2. Suggest to further discuss. So the rapporteur would like to suggest:*RAN2 confirms for sidelink discovery reception the remote UE also needs to check remote UE AS-layer condition.* |
| [**R2-2210625**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119bis-e/Docs/R2-2210625.zip) | U2N relay related clarifications | Nokia, Nokia Shanghai Bell | 4. In clause 8.1 "or receive" is remove from the sentence "The U2N Remote UE, the U2N Relay UE, or both may transmit or receive NR sidelink relay discovery (i.e., as specified in TS 23.304 [22]) if it fulfills the condition(s) defined in TS 38.331 [3].". |

In the above proposed changes, companies suggest to remove the AS threshold condition checking from SUI procedure in RRC spec and from NR sidelink discovery description in 38304. The rapporteur understands the similar issue has been discussed in previous meetings, i.e. companies propose to add the AS threshold condition checking for discovery reception in RRC spec, but majority think AS condition should not control monitoring behavior and LTE sidelink relay has not such limitation, so the change was not agreed.

However, for the proposals to remove threshold condition from SUI and 38.304, the rapporteur also has some concerns, which are mainly on discovery Model A, wherein the Remote UE only needs to monitor the discovery announcement message broadcasted by a Relay UE, then it can choose to select the Relay UE and perform data transmission via the Relay UE, even when the Remote UE is in cell center and the network configures a Uu threshold to restrict only the UEs in cell edge can use U2N relaying functions. This situation would be out of network control and create interference to network and other UEs, which should not be the expectation when the Uu threshold condition was agreed in LTE as a basic relay mechanism.

After further checking LTE spec, although the threshold condition is not used during discovery monitoring, but it is used to trigger RRC connection establishment, which means if the threshold condition is not met, a Remote UE is not allowed to enter RRC\_CONNECTED state to request resource and configuration for relay related communication, which also achieve the purpose that the UE cannot perform relaying function if the threshold condition is not met. In this case, if we want to completely align with LTE spec, the corresponding clauses in NR spec should be updated as well.

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| 5.3.3.1a Conditions for establishing RRC Connection for sidelink communication/ discovery/ V2X sidelink communication/ NR sidelink communicationFor sidelink communication an RRC connection is initiated only in the following case:1> if configured by upper layers to transmit non-relay related sidelink communication and related data is available for transmission:2> if *SystemInformationBlockType18* is broadcast by the cell on which the UE camps; and if the valid version of *SystemInformationBlockType18* does not include *commTxPoolNormalCommon*;1> if configured by upper layers to transmit relay related sidelink communication:2> if the UE is acting as sidelink relay UE; and if *SystemInformationBlockType18* is broadcast by the cell on which the UE camps; or2> if the UE has a selected sidelink relay UE; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met and if *SystemInformationBlockType18* is broadcast by the cell on which the UE camps; and if the valid version of *SystemInformationBlockType18* does not include *commTxPoolNormalCommon* or *commTxAllowRelayCommon*; |

So the rapporteur suggest to first check whether companies do **intentionally** want to allow the UE not met the threshold conditions to ignore the network control. And then check the views on the potential spec changes.

Q1.1: Do companies want to support that when network broadcasts Uu threshold for remote UE, the remote UE is allowed to ignore the threshold and be acting as Remote UE/perform relaying operation by discovery Model A?

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No with comment | We are somewhat open on this, yet would like to highlight that based on the current spec, the Uu threshold is only used for discovery Tx but not Rx.  |
| Ericsson | No  | We think Rapp’s concern makes sense. we shall not allow the UE in the cell centre to trigger relay setup.  |
| Huawei, HiSilicon | No | From network perspective, it is difficult to do load control, resource management, interference management as well as to guarantee the UE performance if there are some UEs are using radio resources out of network control. |
| Apple | See comment | Remote UE is free to receive discovery message in model A. This does not cost any radio resource. I think the Uu RSRP threshold is only applicable to discovery transmission, not reception. If the question is about whether remote UE is allowed to completely ignore NW control, the answer is no. But I am not sure if this is what the CRs intend to do. |
| Xiaomi | No | From load control point of view, we understand the threshold condition should be applicable for both discovery transmission and monitoring. |
| Nokia | No with comment | W think that the Uu threshold is only for discovery Tx, Rx is up-to UE implementation (it will not cause any interference) |
| Qualcomm | See comment | We have same views as Apple. Intention is not to completely ignore NW control, but for receiving discovery messages there need not be threshold check. |
| Lenovo | No | Share the Rapp’s concern. |
| CATT | No | The current threshold is for TX, and there is no limitation on discovery forwarding and replying. |
| Samsung | No | Remote UE should not ignore the NW control. |
| vivo | See comments | We are a bit confused about the question description of Remote UE/perform relaying operation by discovery Model A. If it means the support of Remote UE behavior to check AS-layer condition for discovery reception, the answer is NOT support. The AS-layer condition is only for discovery transmission.  |
| ZTE | No | We think the threshold should be respected by remote UE when initiating the relay discovery.  |

Q1.2: Regrading potential RRC spec change, which way do companies prefer?

* Option1: No further spec change, i.e. no threshold conditions in 5.8.13.2 (discovery monitoring), while keep the threshold conditions in 5.8.3 (SUI);
* Optoin2: Add threshold conditions to 5.8.13.2 (discovery monitoring);
* Option3: Remove threshold conditions from 5.8.3 (SUI), while add the threshold conditions in 5.3.3.1a (establishing RRC connection)/ 5.3.13.1a (resuming RRC connection) to align with LTE spec;
* Other option if any.

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| **Company** | **option** | **Comments** |
| OPPO | See comment | If no change at all (option-1), the pain is in some cases, the SUI message cannot be initiated, if it is OK for network vendor, it is fine for us. So we prefer the change / removal in 5.8.3.2 (option-3 on 5.8.3.2)While for 5.3.3.1a and 5.3.13.1a, we are open to discuss whether it is needed or not. |
| Ericsson | Option 1 | Option 1 shall be already sufficient. We prefer to limit the spec change as much as possible. |
| Huawei, HiSilicon | Option 2 is clearer/cleaner, but can accept option1 if majority prefer it |  |
| Apple  | Option 3 |  |
| Xiaomi | Option 2 | From load control point of view, we understand the threshold condition should be applicable for both discovery transmission and monitoring. |
| Nokia | Option 1 |  |
| Qualcomm  | See comment | We prefer Option 4: change in 5.8.3.2 “Remove threshold conditions from 5.8.3 (SUI)” onlyRestricting SUI in Option 1 is limiting when Remote UE can monitor discovery messages. Hence, we prefer to remove the threshold conditions from 5.8.3.  |
| CATT | Option1 |  |
| Samsung | Option 3 | We share the concern that threshold for discovery message monitoring is not needed but a condition is needed to restrict Remote UE in cell center to access via Relay UE. |
| vivo | Option 3 |  |
| ZTE | Option 2 |  |

Q1.3: Regrading potential 38304 spec change, do companies think

* Q1.3.1: the spec needs to be updated?
* Q1.3.2: the change #4 in R2-2210625 can be agreed?

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| **Company** | **Yes/No to** **Q1.3.1**  | **Yes/No to** **Q1.3.2**  | **Comments** |
| OPPO | Yes | Yes | If we keep the current status in 331 w.r.t. no AS-layer condition for discovery reception. |
| Huawei, HiSilicon | No | No | The current description in TS 38.304 looks fine to us. |
| Apple | Yes | Yes |  |
| Xiaomi | No | No | If option 2 is selected Q1.2, 304 is correct. |
| Nokia (proponent) | Yes | Yes | We think that without this change current 38.304 and 38.331 are not fully aligned |
| Qualcomm | Yes | Yes |  |
| CATT | Yes | Yes |  |
| Samsung | Yes | Yes |  |
| vivo | Yes | Yes | Same view as replied in Q1.1. |
| ZTE | No | No |  |
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## 2.2 Emergency service support/limited service state

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| [**R2-2209892**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119bis-e/Docs/R2-2209892.zip) | Calarification on emergency service support in Rel-17 U2N relay | CATT | Add one note to clarify that the emergency service is not supported in Rel-17 U2N relay. | The rapporteur understands the change is not essential because emergency service is initiated by upper layers, therefore whether it is supported or not in relay case can be agnostic to AS spec. But it would be good to double check others’ view.*RAN2 to discuss whether to clarify in AS specifications that emergency services/limited service level is not supported by remote UE in Rel-17* |
| [**R2-2210625**](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_119bis-e/Docs/R2-2210625.zip) | U2N relay related clarifications | Nokia, Nokia Shanghai Bell | 2. In Clause 4.3. it is clarified that that limited service level is not supported for an L2 U2N Remote UE. |

In R2-2209892, it is proposed to clarify that emergency services is not supported as SA2 is going to support it in Rel-18, while R2-2210625 propose to clarify if a UE is “camping on” a L2 U2N Relay UE, it cannot support limited service level, and propose to add such description in TS 38.304 spec.

The rapporteur understands that from RAN2 perspective, there seems no issue to support emergency service/limited service state, as we have already discussed the cause value of emergency, and adopted the term of serving cell to cover acceptable cell case. But if SA2/CT1 already agree emergency service/limited service state cannot be supported in Rel-17, there seems no harm to make clarifications in AS specifications. Companies’ views are welcome.

Q2.1: do companies agree:

* Q2.1.1: Emergency services cannot be supported in Rel-17?
* Q2.1.2: Clarification is needed to RRC spec as proposed in R2-2209892?

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| **Company** | **Yes/No to** **Q2.1.1**  | **Yes/No to** **Q2.1.2**  | **Comments** |
| OPPO | Unspecified in S2 spec in R17, supported in R18.  | No | For remote-UE’s emergence service when relay UE is in normal service state, there is a NOTE in S2 spec saying this is not specified in R17. And in R18, it is clarified that it is supported.So if companies want to do some clarification in R2 spec, we suggest to limit the discussion to limited service state instead of emergency service, since the latter one has finally supported in R18. In the end, for whether clarify something in R2 spec, we are neutral. |
| Ericsson | SA2 uses the wording “unspecified”, which is different from “not support”. In R17, there is some basic support as RAN2 discussion on emergency cause | No | We don’t see the need to update the RRC. But, if the majority companies would like to introduce RRC change, a better way is just refer to SA2 spece.g. “for U2N remote UE, how the emergency service is supported is captured in TS 23.304” |
| Huawei, HiSilicon | See comments | See comments | Our first preference is to rely on SA2/CT1 spec to define whether those features can be supported by remote UE, and remote UE’s upper layer will make sure the upper layer procedure will not be initiated if the feature is not supported.However, we are also fine to make clarification in AS spec if majority perfer, and the proposal’s from Ericsson seems more compatible with future releases. |
| Apple | Unclear in SA2 | See comment | Either we can send a LS to SA2 to check the exact status; we are also fine with Ericsson proposal |
| Xiaomi | No | No | It’s up to SA2. No impact to RAN2. There is no problem to support emergency service from RAN point of view. |
| Nokia | No | No | As commented above: it is "unspecified", we see no reason for RRC changes. |
| Qualcomm | See comments | See comments | We have same views as Ericsson and support Ericsson proposal |
| Lenovo | See comments | No | We can follow the SA2/CT1 decision. also agree the comments from Ericsson. |
| CATT | Yes | Yes | Our intension is to align the understanding for whether R17 U2N relay is supported or not for remote UE. While reading the RAN spec, it causes understanding that the emergency service for remote UE is supported since it had captured the detailed handlings. But indeed SA2 will only support it in Rel-18. For Ericsson’s suggestion, it is right but not eliminates our doubts.Shall we make clear of this point? Or we can send one LS to SA2 for checking.  |
| Samsung | Same understanding as OPPO and Ericsson | No | We are fine with the text proposal by Ericsson.  |
| vivo | Yes | No with comment | We think the standardization work of emergency services/limited service level by remote UE is within SA2 Rel-18 scope, thus the clarification is fine to us. But regarding the CR wording, we prefer to use a separate NOTE since the current NOTE2 is dedicated for the relay UE behavior on cause value setting, and not from the remote UE perspective. |
| ZTE | See comments | See comments | It is no harm to keep the current form of RAN2 spec since it anyway will be supported. But we are also fine with the proposal from Ericsson. |

Q2.2: do companies agree:

* Q2.2.1: Limited service state cannot be supported in Rel-17?
* Q2.2.2: Clarification is needed to 38.304 as proposed in R2-2210625?

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| **Company** | **Yes/No to** **Q2.2.1**  | **Yes/No to** **Q2.2.2**  | **Comments** |
| OPPO | Unclear in R17, clarified in R18 in S2 spec | Tend to avoid concluding on this in R2 since S2 R17 spec is unclear on this point. | For the limited service of relay-UE, according to our S2 colleagues, there is some uncertainty in R17, yet they clarified it in R18, i.e., Relay UE in limited service state cannot provide service for remote UE. For the limited service of remote-UE, according to our S2 colleagues, there is some uncertainty in R17, yet they clarified it in R18, i.e., Remote UE in limited service state can use relay archiecture. |
| Ericsson | We agree with OPPO | We agree with OPPO | We shall not make hurry conclusion, we may postpone this issue to future meetings to give companies more time to further check.  |
| Huawei, HiSilicon | See comments | See comments | We agree that the UE in limited service state cannot act as relay as it cannot get the dedicated configuration for relaying in a secured way. However, it is not fully clear why remote UE in limited service state cannot connects to a relay UE to obtain emergency services, ETWS and CMAS. but anyway it should be SA2’s call.If there is clear SA2/CT1 agreement, we are ok to clarify in TS 38.304. |
| Apple | Unclear | See comment | Send a LS to SA2 to check |
| Xiaomi | No | No | It’s up to SA2. No impact to RAN2. There is no problem to support limited state service from RAN point of view. |
| Nokia (proponent)  | Yes | Yes | We think that Remote UE cannot be in limited service state when it is connected via an L2 U2N Relay, as there is no concept of "acceptable" Relay. A UE in limited service state may start a relay connection, but as soon as it is connected via the L2 U2N Relay it cannot be in limited service state anymore. |
| Qualcomm | No | No | As per SA2 specs, it seems like limited service state Remote UE can still support UE-to-Network relay operation. So, we do not see any changes necessary to RAN2 specs. |
| CATT | Unclear | See comment | For limited service state, the remote UE should not access the network for calling/data transmission, but the emergency services, ETWS and CMAS should be allowed exceptionally.The tricked point is that the all emergency is not supported by remote UE in R17 even for Normal service state. |
| Samsung | Agree with OPPO | Agree with OPPO |  |
| vivo | Yes | Yes | We think the standardization work of emergency services/limited service level by remote UE is within SA2 Rel-18 scope, thus the clarification is fine to us. But we are acceptable to send LS to SA2 for confirmation before deciding the agreeable CR in RAN2. |
| ZTE | See comments | See comments | It seems there is divergence on the understanding of SA2’s description, so we prefer to send a LS to SA2 for further clarify on emergency service/limited service state of remote UE. |
| Lenovo | See comments | See comments | from RAN2 perspective we can let the Remote UE establish emergency call via the U2N relay. |

## 2.3 NotificationMessageSidelink handling during I2D path switching

R2-2210170 raised one scenario that during the I2D path switch, the Remote UE may not release PC5 unicast link immediately, in which case the Relay UE may have chance to send NotificationMessageSidelink to the Remote UE. In order to avoid the Remote UE initiating RRC reestablishment according to 5.3.7, it propose to make change to RRC spec as blow:

*“if T301 and T304 ~~is~~ are not running, initiate the RRC connection re-establishment procedure as specified in 5.3.7”.*

Q3: Do companies agree with the change in R2-2210170,i.e. *“if T301 and T304 ~~is~~ are not running, initiate the RRC connection re-establishment procedure as specified in 5.3.7”?*

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | The change is fine, although the issue is not essential |
| Huawei, HiSilicon | No, but can follow majority view | We do not think this change is needed, because legacy UE behaviour upon HO is to release source link, although we leave some freedom to UE implementation to decide when to release the source link in path switch, it does not mean it is recommended that remote/relay UE should keep the unicast link after I2D path switch. So we feel making the change kind of acknowledges the UE behaviour of not releasing source link is a normal/typical handling, which should not be the case.[Lenovo]: The remote UE can continue to receive DL data buffered in the relay UE after reception of the path switch command. Therefore, it is remote UE implementation to release PC5 link. |
| Apple | See comment | We agree with the intention, but the change shall be something like:“If T304 is running, the L2 remote UE discards the NotificationMessageSL and not process it.”  |
| Xiaomi | No | We agree with HW. We understand UE shall release the source link after T304 start. Otherwise, it’s multipath, which is not supported in R17. |
| Nokia | Yes |  |
| Qualcomm | No | We think the remote UE behaviour to release the PC5 link on source side is already covered in 5.3.5.5.2. so, we do not need to make the suggested change.2> if the UE is acting as L2 U2N Remote UE at the source side:3> indicate upper layer to trigger PC5 unicast link release.[Lenovo] According to TS38.300, the timing to execute link release is up to UE implementation. |
| Lenovo | Yes | Proponent.In Figure 16.12.6.1-1 (TS38.300), the L2 U2N Remote UE **stops** UP and CP **transmission** via the L2 U2N Relay UE after reception of the *RRCReconfiguration* message with the path switch configuration. The remote UE still has chance to **receive** DL data buffered in the relay UE. That is one reason why only transmission is forbidden in TS38.300. |
| CATT | Yes |  |
| Samsung | No | For I2D path switch case, Relay UE also knows that unicast link should be release so NotificationMessageSL will not be sent to Remote UE.If the intention is to handle a scenario NotificationMessageSL was sent by Relay UE before Relay UE indicates I2D path switch, then the proposed change by Apple looks better. |
| vivo | No | According to current RRC connection re-establishment procedure as specified in 5.3.7.2 , the UE will stop T304 if running. We don’t see critical issue even without this change.5.3.7.2 InitiationUpon initiation of the procedure, the UE shall:1> stop timer T310, if running;1> stop timer T312, if running;1> stop timer T304, if running;1> start timer T311;1> stop timer T316, if running; |
| ZTE | Yes |  |

## 2.4 Relay (re)selection

R2-2209894 proposes the following changes. The reason is that in the current description there is a gap between the level-4 bullet of determining AS criterial is met and the level-4 bullet of having more than one suitable relay. Although the NOTE 2 intended to fill the gap, with the proposed changes the structure seems smoother. In addition, the last level-4 bullet of determining no relay to be selected only reflects AS criteria but not upper layer criteria which seems unclear and better to update anyway. Thus the rapporteur understand the changes are reasonable.

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| 5.8.15.3 Selection and reselection of NR sidelink U2N Relay UE……2>…2> if the UE has a selected NR sidelink U2N Relay UE, and sidelink radio link failure is detected on the PC5-RRC connection with the current U2N Relay UE as specified in clause 5.8.9.3:3> perform NR sidelink discovery procedure as specified in clause 5.8.13 in order to search for candidate NR sidelink U2N Relay UEs;4> when evaluating the one or more detected NR sidelink U2N Relay UEs, apply layer 3 filtering as specified in 5.5.3.2 across measurements that concern the same U2N Relay UE ID and using the *sl-FilterCoefficientRSRP* in *SystemInformationBlockType12* (if in RRC\_IDLE/INACTIVE), the *sl-FilterCoefficientRSRP* in *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED) or the preconfigured *sl-FilterCoefficientRSRP* as defined in 9.3 (out of coverage), before using the SD-RSRP measurement results;4> consider a candidate NR sidelink U2N Relay UE for which SD-RSRP exceeds *sl-RSRP-Thresh* by *sl-HystMin* has met the AS criteria;3> if there is any candidate NR sidelink U2N Relay UE can be regarded as suitable NR sidelink U2N Relay UE:4> consider one of the available suitable NR sidelink U2N relay UE(s) can be selected;3> else:4> consider no NR sidelink U2N relay UE(s) to be selected.NOTE 2: A candidate NR sidelink U2N Relay UE which meets all AS layer criteria defined in 5.8.15.3 and higher layer criteria defined in TS 23.304 [65] can be regarded as suitable NR sidelink U2N Relay UE by the NR sidelink U2N Remote UE. If multiple suitable NR sidelink U2N Relay UEs are available, it is up to Remote UE implementation to choose one NR sidelink U2N Relay UE. The details of the interaction with upper layers are up to UE implementation.NOTE 3: For L2 U2N Remote UEs in RRC\_IDLE/INACTIVE and L3 U2N Remote UEs, the cell (re)selection procedure and relay (re)selection procedure run independently. If both suitable cells and suitable NR sidelink U2N Relay UEs are available, it is up to NR sidelink U2N Remote UE implementation to select either a cell or a NR sidelink U2N Relay UE. Furthermore, L3 U2N Remote UE's selection on both cell and NR sidelink U2N Relay UE is also based on UE implementation. |

Q4: Do companies agree with the above change in R2-2209894 for relay (re)selection?

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No | The intention has always been reflected in the NOTE, there is no need to reclaim it in normative text. |
| Ericsson | Yes | Changes are reasonable. Better to use normative text than a note. |
| Huawei, HiSilicon | Yes | We consider this change is an improvement of the spec structure, meanwhile it does not emphasize higher layer criteria in the sentence actually, not sure what’s the concern from companies. |
| Apple | No | I do not see a gap issue in current text. The check of higher layer criteria is mentioned by the first sentence of NOTE 2. If we can remove the first sentence of NOTE 2 by apply this change, we can support this. But the new text still rely on NOTE 2. Then, we do not see a point to make this change. |
| Xiaomi | No | We have similar view as Apple. There is no issue in existing spec. Even with the change, higher layer criteria still rely on the NOTE2 to check. So, it’s more like cosmetic change. |
| Nokia | Yes |  |
| Qualcomm | No | change not needed. NOTE2 already in spec is sufficient. |
| Lenovo | Yes | Prefer normative text |
| CATT | Yes | The comment’s point is not for NOTE2 is insufficient. The point is procedure flow. The current spec’s procedure is leaked, imagine a case that all the potential relays meet high layer criteria but do not meet AS criteria, none of the two branches will be entered. Is this acceptable to you? |
| Samsung | No | We think that NOTE 2 is clearly says that suitable U2N relay meets all AS layer criteria and higher layer criteria. |
| vivo | No strong view |  |
| ZTE | No | We think the current text is clear enough. The change is not necessary. |

## 2.5 RLC handling

For the discussion on Proposal 2.2, the key point is when Tx-UE establish Tx RLC channel whether it is triggered by Rx UE as other DRBs/SRB using dedicated configuration or establish using default configuration autonomously as specified SL\_RLC0. Both options can work but different specification impact is expected.

Q5: Which option do companies prefer for default SL-RLC1 configuration?

* Option1: default SL\_RLC1 configuration is used to establish Rx RLC channels for SRB1 messages without Tx UE’s indication (align with current specification);
* Option2: Tx-UE uses PC5-RRC to inform Rx-UE to establish RLC channel by applying default SL\_RLC1 configuration, in this case one special PC5 RLC channel ID needs to be reserved and network should not use this value for PC5 channel configuration via Uu message. (Clarification on the channel ID reservation is required in spec).

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| **Company** | **option** | **Comments** |
| OPPO | 2 | We do not think option-1 = no change to the spec.If we abandon PC5-RRC signaling for default configuration of SRB1-RLC (but not for the dedicated RLC configuration of SRB1, which means anyway it is not a clean method for SRB1), we see the issue that in case of ‘change from default to dedicated configuration and later back to **default configuration’**, finally Tx still needs to rely on **PC5-RRC signaling** to update the configuration @ Rx.Opponent (of option-1) may argue that, in order to avoid PC5-RRC in such case, one solution is to always use separate LCID for dedicated SRB1-RLC and default SRB1-RLC, which means 1. There would more than one LCID (other than 57) occupied by SRB1-RLC
2. When a dedicated configuration for SRB1-RLC is added, Rx UE has to perform SL\_RLC1 release although no explicit signaling to tell the Rx UE to do so; Or When a dedicated configuration for SRB1-RLC is released, Rx UE has to perform SL\_RLC1 adding although no explicit signaling to tell the Rx UE to do so => This part of the operation is obviously new and would lead to spec impact.

On the contrary, for option-2, we just need to decide a RLC channel ID for the SL\_RLC1, (as for dedicated RRC configuration for SRB1-RLC), e.g., we can fix the RLC channel ID for SL\_RLC1, e.g., 1, so that all the other procedural text in spec can be kept without further change, and we can still limit the LCID for SRB1-RLC to 57.Based on the analysis above, we believe option-2 is the one with less impact actually. |
| Ericsson | Option 1 | We think the current spec is sufficient |
| Huawei, HiSilicon | No strong view | Both work, and have pros and cons.Since default configuration is already there in spec, it is not a must to be configured by Tx UE, option 1 is simpler, but it also means for SRB1, the handling on default configuration and dedicated configuration is not the same.Option2 requires more spec clarifications, but it may be easier to be understood how to behave by Tx UE. |
| Apple  | Option 1 | We think the current spec is fine.  |
| Xiaomi | Option 1 | We understand the default RLC for SRB1 is used during initial access. After initial access, TX UE can decide whether to reconfigure RLC. RX UE can acknowledge the RLC configuration for SRB1 based on the associated logical channel identity, i.e. 57. |
| Nokia | Option 1 | We think that the current specification is OK |
| Qualcomm | Option 1 |  |
| Lenovo | Option 1 | No change is needed. |
| CATT | Option 1 |  |
| Samsung | Option 1 |  |
| vivo | Option 1 | We think the default configuration is defined in the spec and doesn’t need to be indicated via dedicated signaling. |
| ZTE | Option 1 | We think that the current specification is fine. |

For the discussion on proposal 13, the rapporteur would like to highlight this proposal is in line with what has been supported in Rel-16 for V2X, if more things are to be supported, new UE logic to handle the configuration of setup/modification/release needs to be discussed and specified. If there is no strong necessity for the new handling, it is suggested to just keep what can be supported in current spec and avoid any over-optimization at this stage.

Q6.1: Do companies agree that each PC5 Relay RLC channel configuration provided by network to Relay UE is uniquely associated with one Remote UE?

(If the answer is no, please indicate why it is necessary to use one configuration for multiple RLC channel establishment?)

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| **Company** | **Yes/No** | **Comments** |
| OPPO |  |  Firstly, we understand ‘each PC5 Relay RLC channel configuration provided by network to Relay UE is uniquely associated with one Remote UE’ is anyway a possible NW implementation, and thus has to be supported by UE implementation. And the Q is whether it is the only implementation, and thus if not, UE implementation may take more cases into account. During the previous discussion, however, we heard some voice from some UE vendor to argue it is not the only implementation, yet some voice from some NW vendor to argue it is the only implementation.. which is confusing to us: I thought unless NW vendor has an intention to support an extra implementation, UE vendor can agree/disagree to support the extra implementation. So we would like to hear more from the NW vendor first to know if it is a real issue to discuss. If so, and if there is objection from some UE vendors on it, we can further debate to conclude. |
| Ericsson | Yes | This is the typical behaviour (e.g., same as Uu), given remote UE is just like a normal UE to the gNB. The question itself is not clear. It needs to be stated that, if companies answer Yes, meaning no spec change. |
| Huawei, HiSilicon | Yes | We do not see the reason to complicate things by introducing something not supported in Rel-16 v2x when the signalling is copied from Rel-16. although we are open to make clarification in spec if companies think there is any ambiguity, but it should be very clear that Rel-16 signalling is one configuration associates with one RLC bearer, and we have never discussed there can be more for relay. |
| Apple | Yes.but there is always spec change either way | Current Text in 5.3.5.14:1> if *sl-RLC-ChannelToAddModList* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:2> perform PC5 Relay RLC channel addition/modification as specified in 5.8.9.7.2;If we support P13: For adding a PC5 Relay RLC channel, the relay UE relies on the unique association of PC5 relay RLC channel to a remote UE, which is only indicated by *sl-L2IdentityRemote* and *SL-SRAP-config-relay* in a different configuration IE to accomplishing the procedure in 5.8.9.7.2 or triggering the PC5-RRC procedure in 5.8.9.1.2. This important link is missing in the current spec, so L2 relay UE will be confused about how this “perform PC5 Relay RLC channel addition” works. For PC5 relay RLC channel modification/release, the relay UE can rely on the existing RLC entity associated with the unique index of PC5 Relay RLC channel, so the current spec is fine. If we do not support P13:The PC5 Relay RLC channel configurationis a “template” which can be used for multiple remote UEs. Then the above text is also wrong. Because even if there is no new *sl-RLC-ChannelToAddModList* is included in *sl-ConfigDedicatedNR*, the procedure shall still be triggered by the new remote UE included in *sl-RemoteUE-ToAddModList* in the same RRCReconfiguration message. Also, once a PC5 Relay RLC channel template is modified or released by NW, multiple remote UEs will be affected and all those procedures needs to be updated to ensure the right set of remote UE(s) get their PC5 relay RLC channel(s) updaterd or deleted. Given the amount of changes/case we need to deal with in either way, we think supporting P13 makes less spec change. |
| Xiaomi | Yes | Option 1 is simpler |
| Nokia | Yes | It is not clear if YES requires any additional clarifications in the specifications |
| Qualcomm | Yes | we think the existing spec is clear and do not see a need for spec change |
| Samsung | Yes | We confirm that channel configuration is per UE. We have some sympathy for Apple. But we are fine to follow majority if majority companies feel no specification change is needed. |
| vivo | See comments | We are OK to go with proposal 13 for minimized spec impact, but it is better to clarify in the spec of such NW configuration restriction. |
| ZTE | Yes | To avoid the potential confusion, it would be better to add the corresponding remote UE ID into the SL-RLC-ChannelConfig-r17. |
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Q6.2: If it is allowed to create multiple RLC channels using one RLC configuration, how to trigger the relay UE to establish the RLC channel using the existing configuration?

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| **Company** | **Comments** |
| Apple | This has to be done based on the *sl-L2IdentityRemote* and *SL-SRAP-config-relay* in a different configuration IE enclosed in the same RRC message. Therefore, if any “egress PC5 channel” of any remote UE in the *sl-RemoteUE-ToAddModList* has an value identical to the index of “PC5 RLC channel”. The remote UE needs to be selected as the destination to trigger PC5 Relay RLC channel addition. |
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Q6.3: If it is allowed to create multiple RLC channels using one RLC configuration, when one of the RLC channels needs to be modified, how the relay UE differentiate which one to modify?

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| **Company** | **Comments** |
| Apple | Same as Q6.2 for “modification” case. But we need to consider that there may be no delta part in SRAP configuration, so there is no “*sl-RemoteUE-ToAddModList* “ may not be updated in the same RRC message., so relay UE need to based on the exising context of remote UEs. |
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Q6.4: If it is allowed to create multiple RLC channels using one RLC configuration, when one of the RLC channels needs to be released, how the relay UE differentiate which one to release?

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| **Company** | **Comments** |
| Apple  | Same as Q6.2 for “release” case. |
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3. Conclusion