3GPP TSG-RAN WG2 Meeting #118 Electronic R2-220xxxx

Online, 9 May – 20 May 2022

**Agenda item: 6.7.2.1**

**Source: Lenovo**

**Title: Summary of [Pre118-e][608][Relay] Summary of AI 6.7.2.1 on CP (Lenovo)**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the summary report of [Pre118-e][608][Relay] Summary of AI 6.7.2.1 on control plane (Lenovo).

* [Pre118-e][608][Relay] Summary of AI 6.7.2.1 on CP (Lenovo)

* **Phase I:** Companies are invited to provide feedback on the questions by 4th May 1600 UTC.
* **Phase II:** Rapporteur submits a summary and proposals based on the feedback, and companies can comment on the summary by 9th May 10:00 UTC.

# 2 Contact Points

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# 3 Discussion

* 1. **System Information**

**3.1.1 MIB**

The contribution [25] has the following proposal:

*Proposal 2. RAN2 is asked to discuss and accept the proposed TP B in Annex A (in case RRC\_IDLE or RRC\_INACTIVE Remote UE in out of coverage but is connected with Relay UE to NW, the Remote UE does not perform the actions for MIB acquisition in clause 5.2.2.5)*

A fundamental question here is if a Remote UE needs MIB information? If not, an IC remote UE (i.e., U2N Remote UE in RRC Idle, Inactive or Connected state), need not consider MIB as part of Essential System Information missing (and therefore do not apply clause 5.2.2.5 for missing MIB) and as [25] suggests, need not acquire it.



Figure 1: MIB

**Question 1a: Do companies think MIB information is necessary for a U2N Remote UE?**

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**Question 1b: If you answered “Yes”, can MIB be provided in the same fashion as SIB1 (i.e., no separate requests + MIB updates, if any to be provided by Relay UE on its own)?**

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**Question 1c: If you answered “No”, does RRC specification needs to capture accordingly (i.e., Remote UE need not consider MIB as part of Essential System Information missing and do not apply clause 5.2.2.5 for missing MIB; and as [25] suggests, need not acquire it?)?**

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* + 1. **SIB1**

**From [18], the following proposal is made:**

Proposal 3: The unsolicited forwarding of SIB1 should be captured in the trigger condition of relay UE’s Uu message transfer.

On this point, though the 3rd condition (highlighted below) already covers this, but this will make SIB1 forwarding by Relay to Remote UE conditional to a SIB request (for any SIB) from the remote first i.e., it does not allow the Relay to forward SIB1 to the Remote UE beforehand.

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| 5.8.9.9.2 Actions related to transmission of *UuMessageTransferSidelink* messageThe L2 U2N Relay UE initiates the Uu message transfer procedure when one of the following conditions is met:1> upon receiving *Paging* message related to the connected L2 U2N Remote UE from network;1> upon acquisition of the SIBs requested by the connected L2 U2N Remote UE (as indicated in *sl-Requested-SI-List* in the *RemoteUEInformationSidelink*);1> upon receiving the updated SIB1 and the SIBs have been requested by the connected L2 U2N Remote UE from network; |

**Question 2: Do you agree that an unsolicited forwarding of SIB1 should be clarified in the trigger condition of relay UE’s Uu message transfer to enable Relay UE to forward SIB1 to the Remote UE even before receiving RemoteUEInformationSidelink?**

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Further, from [27], it is written thatthe Relay UE will not provide SIB1 anymore (since remote UE has released the request to forward SIB(s) when entering RRC\_Connected State) and in RRC\_Connected state a Remote UE has no means to request SIB1. Therefore, **a Remote UE entering RRC\_Connected may consider Essential system information (SIB1) as missing.** Following proposal is made:

Proposal: Relay UE keeps forwarding SIB1 update to a remote UE even after having received the sl-Requested-SI-List set to release from the remote UE.

**Question 3: To ensure that an RRC\_Connected Remote UE maintains a valid version of SIB1, do you agree with “Relay UE keeps forwarding SIB1 update to a remote UE even after having received the sl-Requested-SI-List set to release from the remote UE”?**

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* + 1. **System Information aspects of RemoteUEInformationSidelink**

From [10]

Proposal 2: Clarify when the L2 U2N remote UE entering RRC\_CONNECTED, it shall transmit *RemoteUEInformationSidelink* message to the relay UE if it had sent paging or SIB forward request to the current relay UE.

The above proposal seems logical, and a reasonable UE should be implemented that way, the question is if this needs to be captured in the specification?

**Question 4: Do you agree with P2 above?**

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**3.1.4 Book-keeping and stored information at Relay**

It is reasonable to assume that a Relay UE needs to remember which SIBs were requested by a Remote so that it can forward the updates of the same requested SIBs. The contribution [12] raises this aspect in the following proposals:

Proposal 1 RAN2 to confirm that Relay UE can obtain updated SIB(s) on behalf of Remote UE with stored information about Remote UE’s interest in SIB(s) and without a request from Remote UE.

Proposal 2 RAN2 to confirm that Relay UE maintains multiple requests of SIBs to enable the obtaining and forwarding of updated SIB(s) for remote UE.

The key question (assuming RAN2 confirms these two proposals) is if something needs to be captured in the specification. One possible and useful way would be to clarify this in section 5.8.9.9.2 by adding “or their update” as shown below:

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| 5.8.9.9.2 Actions related to transmission of *UuMessageTransferSidelink* messageThe L2 U2N Relay UE initiates the Uu message transfer procedure when one of the following conditions is met:1> upon receiving *Paging* message related to the connected L2 U2N Remote UE from network;1> upon acquisition of the SIBs or their update requested by the connected L2 U2N Remote UE (as indicated in *sl-Requested-SI-List* in the *RemoteUEInformationSidelink*);1> upon receiving the updated SIB1 and the SIBs have been requested by the connected L2 U2N Remote UE from network; |

**Question 5: Would you confirm the proposals from [12] and agree to the change shown above (or similar) in section 5.8.9.9.2?**

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On the same topic, but different point: [32] believes that “The relay should avoid making multiple SI requests triggered from different remote UEs”. Do you agree to specify this?

**Question 6: Do you agree that a Relay UE performs SI acquisition only if the relay UE does not have stored valid version of the system information indicated in sl-Requested-SI-List and a Uu SI request by the relay UE for the system information is not pending?**

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**3.1.5 Requesting System Information (SI or SIB)**

Documents [4], [18] with CR in [19] think that a Remote UE should be allowed to request any SIB (Rel. 16, 17, Public Safety) and corrections have been proposed to ensure that Request for System Information is actually for SIBs (and not for SI-messages). Do you agree?

**Question 7a: Do you agree that a Remote UE can indicate his interests for any SIBs (not SI-messages) to Relay UE via RemoteUEInformationSidelink” and this needs ASN.1 changes as proposed in [4], [19]?**

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Continuing the discussion for positioning SI, [5] proposes to Support inclusion of a per-posSI or per-posSIB request (to align with the handling of the existing sl-Requested-SI-List-r17) in the RemoteUEInformationSidelink message.

**Proposal 7b: Do you support inclusion of a per-posSI or per-posSIB request (to align with the handling of the existing sl-Requested-SI-List-r17) in the RemoteUEInformationSidelink message?**

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**3.1.6 System Information: Other issues**

**Reducing broadcast overhead for deriving SL connection timers (T300, T301 and T319)**

RIL [B100] was agreed in the ASN.1 ad-hoc and [26] proposes to further reduce the SIB signalling: A single SL time-offset is included in SIB12. To derive SL connection timers (T300, T301 and T319), this offset is added on the corresponding connection timer in *ue-TimersAndConstants* received in SIB1.

**Question 8: Do you agree to reduce broadcast overhead by deriving SL connection timers (T300, T301 and T319), by using a single PC5 time offset added on the corresponding connection timer in ue-TimersAndConstants received in SIB1?**

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**Emergency call**

Doc [8] raises and interesting question suggesting that it may be left to UE implementation to select an acceptable cell or a suitable relay UE to originate an emergency call when UE has no suitable cell.

According to TS38.304, an acceptable cell must also meet the cell selection criteria (clause 5.2.3.2) i.e., S criterion. So, for the same cell, where a UE can only receive Limited service, the configured threshold (entry) conditions should generally not allow a UE to act as a remote UE. And, if the serving cell of a relay UE is different and can allow a connecting remote UE to have normal services, then the remote UE should prefer to connect via the Relay. If, as the proponents propose to leave this to UE implementation, is there anything to capture here?

**Question 9: Is there anything to specify, including a Note to specify UE behaviour to select an acceptable cell or a suitable relay UE to originate an emergency call when UE has no suitable cell?**

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**3.2 Paging**

**3.2.1 Paging Release**

Paper [1] argues that upon the PC5 RRC connection with remote UE is released, relay UE initiate transmission of the. *SidelinkUEInformationNR* message to release the received *sl-PagingIdentity-RemoteUE* from the remote UE and release the corresponding paging information. Given that a gNB can’t forward the paging messages to the remote UE via the same Relay anymore (as the RRC Connection has been released), this proposal makes sense.

**Question 10: Do you agree that upon PC5 RRC connection release, relay UE initiate transmission of the *SidelinkUEInformationNR* message to release the corresponding *sl-PagingIdentity-RemoteUE*?**

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Doc [9] on the same topic but with a different scenario thinks that once the remote UE enters into RRC\_CONNECTED, why the relay UE needs to send the release message through *SidelinkUEInformationNR* from relay UE to gNB? Considering once the remote UE enters into RRC\_CONNECTED state, there will be no paging message needed for the RRC\_CONNECTED remote UE anymore. It is redundant to release the paging request of remote UE via *SidelinkUEInformationNR* from relay UE to gNB under the procedure of 5.8.9.8.3 in[1]. Here one can argue that, basically RAN2 never intended to make Remote UE’s transition to RRC\_Connected known to the relay UE, therefore this is fine to let the relay UE send the release message through *SidelinkUEInformationNR* to gNB.

**3.2.2 UE specific DRX cycle not configured**

Documents [18] and [30] identify the same issue that sometimes UE specific DRX cycle may not configured. In this case, their resolution is that in section 5.8.9.8.3, indicate that the relay calculates the paging occasions of the remote UE using the minimum of the DRX cycle received from the remote UE and the default only when a value is received from the remote UE.

**Question 11: Do you think it is necessary to handle and specify the situation that sometimes UE specific DRX cycle may not configured?**

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**Other minor issues from CR**

**From [19] following points are remaining:**

These seem to be simple enough:

Point 1) Relay UE monitor remote UE’s paging message at remote UE’s paging occasion, the calculation of remote UE’s paging occasion need UE ID and UE specific DRX cycle of remote UE. The procedure in 5.8.9.8.3 does not mention “sl-PagingIdentity-RemoteUE”.

Point 2) The “sl-SIB1-Delivery” is missing in procedure 5.8.9.9.3.

**Question 12a: Do you agree with point 1 and point 2 of [19] above?**

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**Stage 2 issues from [3]**

1. NR sidelink communication is used to carry the 5G Proximity based Services (ProSe) as defined in TS 23.304, which cover 5G ProSe Direct Discovery, 5G ProSe Direct communication and 5G ProSe UE-to-Network Relay Communication.
2. There is a typo at SRAP header on the remote UE’s SRAP prcessing (which should be PC5 SRAP). There is a restriction on the update of local Remote ID via RRCReconfiguration message from gNB to only Relay UE
3. Unclear text for the resource allocation of Relay discovery.
4. The configuration of within RRCSetup message gNB to U2N Remote UE during RRC connection establishment is not clear.
5. Lack of readability on the description for paging monitoring indication
6. Lack of reference number for the referred TS.
7. The identity information within RRCReconfiguration message (for the case that Remote UE switches from direct to indirect path) is not complete.

All above issues seem to not require any technical discussions.

**Question 12b: do you object/ disagree to capture any of the 7 points above?**

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**3.3 Cell change of remote UE**

* + 1. R2-2204551

[2] R2-2204551 Discussion on cell change of remote UE due to relay UE's cell change SHARP Corporation discussion NR\_SL\_relay-Core

In [2], it mentioned that a relay UE could forwards new SIB1 after HO and cell reselection to the remote UE connecting to it. Then, a remote UE, if the received SIB1 includes a different cell, consider a cell reselection occurs. Namely, the cell change of remote UE in IDLE/INACTIVE state occurs due to relay UE’s cell change.

It further pointed out that there are different behaviours of the remote UE for legacy cell reselection and cell change due to relay UE’s cell change.

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| Timer | Case |
| Cell change due to relay UE’s cell change | Cell reselection |
| T300 | Keep running till expiry.Upon expiry, UE goes to IDLE | Stop if running, and UE goes to IDLE |
| T319 | Keep running till expiry.Upon expiry, UE goes to IDLE | Stop if running, and UE goes to IDLE |
| T390 | Keep running till expiry.Barring alleviated till expiry. | Stop if running, and barring alleviated |
| T302 | Keep running till expiry.Barring alleviated till expiry. | Stop if running, and barring alleviated |

[2] prefers the same behaviours for cell change of remote UE due to relay UE’s change can be applied as cell reselection. So, [2] proposes:

**Proposal 2: specify that for a remote UE, if the received SIB1 includes a different cell, consider a cell reselection occurs.**

**Change from TP:**

<begin>

5.2.2.4.2 Actions upon reception of the *SIB1*

Upon receiving the *SIB1* the UE shall:

1> store the acquired *SIB1*;

1> if the L2 U2N Remote UE is in RRC\_IDLE or in RRC\_INACTIVE,

2> if the *cellIdentity* in the acquired *SIB1* is different from the stored *cellIdentity,*

3> consider cell re-selection occurs;

1> if the *cellAccessRelatedInfo* contains an entry of a selected SNPN or PLMN and in case of PLMN the UE is either allowed or instructed to access the PLMN via a cell for which at least one CAG ID is broadcast:

2> in the remainder of the procedures use npn-IdentityList, trackingAreaCode, and cellIdentity for the cell as received in the corresponding entry of npn-IdentityInfoList containing the selected PLMN or SNPN;

1> else if the cellAccessRelatedInfo contains an entry with the PLMN-Identity of the selected PLMN:

2> in the remainder of the procedures use plmn-IdentityList, trackingAreaCode, and cellIdentity for the cell as received in the corresponding PLMN-IdentityInfo containing the selected PLMN;

<end>

**Rapporteur comments:**

* For T302, ‘upon cell change due to relay (re)selection’ has been added in TS38.331 as stop condition.
* For T390, ‘upon cell change due to relay (re)selection’ has been added in TS38.331 as stop condition.
* For T300, [R2-2204960](file:///D%3A%5COneDrive%20-%20Lenovo%5C3GPP%5CRAN2%5CTSGR2_118%5CDocs%5CR2-2204960.zip) propose that ‘cell changes due to relay handover or relay UE’s cell re-selection’ can be added as stop condition to stop T300, which will be discussed in another question of this summary.

**Question 13: Do companies agree on the proposal and change for Remote UE in RRC\_IDLE or in RRC\_INACTIVE in [2]?**

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3.3.2 R2-2204960

[14] R2-2204960 [B105] TP on setup request procedure Lenovo discussion Rel-17

In [14], it mentioned that a remote UE shall start T300 if a L2 U2N remote UE transmits RRCSetupRequest message to the serving cell via L2 U2N relay UE. Before receiving the response from the serving cell, the remote UE may receive the notification message due to relay UE handover, Uu RLF, relay reselection or L2 U2N Relay UE’s RRC connection failure.

After the remote UE receives the notification, the remote UE will perform relay/cell reselection if the remote UE decides not to keep PC5 link. According to section 5.3.3.6 and 5.3.11 of TS38.331, the remote UE will stop T300 (see B104, R2-2204959).

If the remote UE decides to keep PC5 link after the remote UE receives notification message, relay/cell reselection will not happen. If the serving cell of the relay UE changes, it is better for the remote UE to stop T300. Therefore, we propose:

**Proposal 1: The remote UE shall stop T300, if running, when cell changes due to relay handover or relay UE’s cell re-selection.**

**Changes from TP:**

<begin>

5.3.3.6 Cell re-selection or cell selection while T390, T300 or T302 is running (UE in RRC\_IDLE)

The UE shall:

1> if cell reselection occurs while T300 or T302 is running; or

1> if relay reselection or cell change due to handover or cell reselection of the connected relay UE occurs while T300 is running; or

1> if cell changes due to relay reselection while T302 is running:

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'RRC connection failure';

1> else if cell selection or reselection occurs while T390 is running, or cell change due to relay selection or reselection occurs while T390 is running:

2> stop T390 for all access categories;

2> perform the actions as specified in 5.3.14.4.

7.1.1 Timers (Informative)

| Timer | Start | Stop | At expiry |
| --- | --- | --- | --- |
| T300 | Upon transmission of *RRCSetupRequest.* | Upon reception of *RRCSetup* or *RRCReject* message, cell re-selection, cell change due to handover or cell reselection of the connected relay UE, the (re)selected L2 U2N Relay UE becomes unsuitable, and upon abortion of connection establishment by upper layers. | Perform the actions as specified in 5.3.3.7.  |

<end>

**Question 14: Do companies agree on the proposal and change in [14]?**

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* + 1. R2-2204961

[15] R2-2204961 [B106] TP on re-establishment procedure Lenovo discussion Rel-17

[15] thinks that it is possible that the remote UE receives the notification message from the relay UE when T301 of the remote UE is running. After the remote UE receives notification message, the remote UE may or may not decide to perform relay/cell reselection. If the remote UE decides to perform relay/cell reselection, UE needs to stop T301. If the remote UE decides to keep the current PC5 link, the remote UE will further monitor the discover message because relay UE will transmit the discovery message including new cell ID once relay UE changes to the new serving cell. If the cell of relay UE changes, the remote UE also need to stop T301. Therefore, we propose the remote UE shall stop T301 upon cell of the remote UE change.

**Proposal 1: The remote UE shall stop T301 upon cell of the remote UE change.**

**Changes from TP:**

<begin>

5.3.7.7 T301 expiry or selected cell no longer suitable

The UE shall:

1> if timer T301 expires;

1. if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 38.304 [20]; or
2. if cell change due to relay handover or cell reselection of relay UE:

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with release cause 'RRC connection failure'.

7.1.1 Timers (Informative)

|  |  |  |  |
| --- | --- | --- | --- |
| T301 | Upon transmission of *RRCReestabilshmentRequest* | Upon reception of *RRCReestablishment* or *RRCSetup* message as well as when the selected cell becomes unsuitable, the (re)selected L2 U2N Relay UE becomes unsuitable or cell change due to relay handover or cell reselection of relay UE. | Go to RRC\_IDLE |

<end>

**Question 15: Do companies agree on the proposal and change in [15]?**

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| Company | Agree on Proposal?(Yes or No) | Agree on Change?(Yes or No) | Comments |
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* 1. **Stop condition for T300**
		1. R2-2204959

[13] R2-2204959 [B104] TP on stop condition of T300 Lenovo discussion Rel-17

In [13], it mentioned that in legacy specification for Uu link (see section 5.3.3.6 of TS38.331), if cell reselection occurs while T300, UE shall perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'RRC connection failure'. In section 5.3.11 of TS38.331, UE shall stop all timers that are running except T302, T320, T325, T330, T331 and T400. Namely, UE shall stop T300 if running. ‘cell reselection’ is added as stop condition of timer table in section 7.1.1

In current specification for relay link (see section 5.3.3.6 of TS38.331), if relay reselection occurs while T300 is running, UE shall perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'RRC connection failure'. In 5.3.11, UE shall stop all timers that are running except T302, T320, T325, T330, T331 and T400. Namely, UE shall stop T300 if running. Therefore, ‘relay reselection’ should be added as stop condition of timer table in section 7.1.1.

**Proposal 1: ‘relay reselection’ should be added as stop condition of T300 in section 7.1.1..**

**Changes from TP:**

<begin>

7.1.1 Timers (Informative)

| Timer | Start | Stop | At expiry |
| --- | --- | --- | --- |
| T300 | Upon transmission of *RRCSetupRequest.* | Upon reception of *RRCSetup* or *RRCReject* message, cell re-selection, relay re-selection,the (re)selected L2 U2N Relay UE becomes unsuitable, and upon abortion of connection establishment by upper layers. | Perform the actions as specified in 5.3.3.7.  |

<end>

**WI RRC Rapp Comments from the RIL list:** The proposed change seems duplicated with current saying of "the (re)selected L2 U2N Relay UE becomes unsuitable".

As a moderator, I would like to point out that ‘suitable relay’ is defined in TS38.300 as follow. Therefore, “the (re)selected L2 U2N Relay UE becomes unsuitable” refers to that the PC5 link does not meet the threshold.

*A U2N Relay UE is considered suitable by a U2N Remote UE in terms of radio criteria if the PC5 link quality measured by U2N Remote UE towards the U2N Relay UE exceeds configured threshold (pre-configured or provided by gNB).*

**Question 16: Do companies agree on the proposal and change in [13]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Agree on Change?****(Yes or No)** | **Comments** |
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* 1. **Connection management and re-establishment**
		1. R2-2205115

[20] R2-2205115 remaining issues for control plane procedure for relay operation LG Electronics France discussion Rel-17

In [20], it mentioned that gNB may send RRC connection release message to both remote UE and relay UE, but the remote UE may not receive the release message for any reason. In this case, Remote UE considers itself as RRC\_CONNECTED state, the remote UE may keep sending messages to the gNB via relay UE without RRCSetupRequest, RRCReestablishRequest or RRCResumeRequest messages. So, if remote UE keeps sending messages to relay UE, the relay UE should be able to send the notification message to inform that the relay UE has become already RRCReleased.

**Proposal 1: When the Remote UE keeps sending data messages to Relay UE even though relay UE has become RRCReleased, the Relay UE can send the notification message to the Remote UE to inform of becoming RRC released.**

**Rapporteur comments:** It could be a rare case that gNB may send RRC connection release message to both remote UE and relay UE. But the remote UE may not receive the release message for any reason. In addition, if idle relay UE receives the information towards gNB from the remote UE, the relay UE will transit to connected state rather than sending the notification message.

**Question 17a: Do companies agree on the proposal 1 in [20]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Comments** |
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[20] pointed out that when remote UE receives the notification message from Relay UE, the remote UE decides on maintain or release the current PC5 RRC connection. But how long the remote UE maintains the PC5 RRC connection seems to be Remote UE’s implementation. Remote UE can estimate the timer value used by relay UE if the timer value is delivered by SIB. Maybe the Remote UE decides how long to maintain the PC5 RRC connection based on the timer value used by Relay UE. But, for example, such as ‘waitTime’ given with RRCRelease message to the Relay UE cannot be estimated by Remote UE. So, in this case, we suggest the Relay UE can inform the ‘waitTime’ to the Remote UE in the notification message from Relay UE. Using this timer value, the Remote UE can decide how long to maintain the PC5 RRC connection.

**Proposal 2: Relay UE notifies ‘waitTime’ delivered with RRCRelease message (e.g., T302 timer) to the Remote UE. This information will be helpful for the Remote UE to decide how long to maintain the current PC5 RRC connection.**

**Rapporteur comments:** The ‘waitTime’ could be helpful for the remote UE to make a decide. But it is optimized issue.

**Question 17b: Do companies agree on the proposal 2 in [20]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Comments** |
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In [20], it further mentioned that the remote UE will stop T311 timer when deciding to maintain the PC5 RRC connection during re-establishment according to the current running CR. But we have concern that it’s too early to stop T311 timer. Because Remote UE can change its decision from maintaining the PC5 RRC connection to starting RRC connection reestablishment while T311 timer is running. Stopping T311 timer seems to be too early when the remote UE decides to maintain the PC5 RRC connection. So, we suggest the phrase ‘stop T311 if running’ be removed.

**Proposal 3: Remove the phrase 'stop T311 if running 'when Remote UE decides to maintain the PC5 RRC connection.**

**Rapporteur comments:** After the remote UE receives notification message, the remote UE initiates re-establishment procedure and starts T311 for cell/relay selection. The remote UE decides to maintain the current PC5 link based on the evaluation e.g whether the suitable relay/cell is available, QoS, etc. Therefore, it is a rare case that the remote UE changes the decision when T311 is running.

**Question 17c: Do companies agree on the proposal 3 in [20]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Comments** |
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* + 1. R2-2205131

[21] R2-2205131 Connection establishment and resume failure occurrence to a L2 U2N Remote UE ASUSTeK CR Rel-17 38.331 17.0.0 3052 - F NR\_SL\_relay-Core

In [21], it mentioned that the relay UE will transmit notification message or PC5-S message to the remote UE upon the connection establishment/resume failure. Similarly, the connection establishment/resume failure may also occur to a L2 U2N Remote UE when it performs the connection establishment/resume procedure via a L2 U2N Relay UE. In this situation, [21] thinks the L2 U2N Remote UE may also trigger PC5-S release or keep the current PC5 connection.

**[21] proposes the L2 U2N Remote UE may trigger PC5-S release or keep the current PC5 connection upon the connection establishment/resume failure.**

**Rapporteur comments:** [21] considers the case that the remote UE fails to perform the connection establishment/resume when the PC5 link is available. That means there is a problem in Uu link. Therefore, the remote UE will receive the PC5-S message or notification message from the relay UE in this situation.

**Question 18: Do companies agree on the proposal and draftCR in [21]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Agree on Change?****(Yes or No)** | **Comments** |
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* + 1. R2-2205856

[28] R2-2205856 Correction for RRC Reestablishment in Sidelink relay Nokia, Nokia Shanghai Bell draftCR Rel-17 38.331 17.0.0 F NR\_SL\_relay\_enh-Core

[28] pointed out that in section 5.3.7.2 it is specified when the UE initiates the RRC reestablishment procedure, with sidelink relay being included as;
“upon detecting sidelink radio link failure by L2 U2N Remote UE in RRC\_CONNECTED, in accordance with subclause 5.8.9.3; or”. However, the reestablishment procedure initiated is for Uu connection and it is not clear in this case why PC5 radio link failure would trigger Uu RRC reestablishment per default based on the below agreements.

**Changes from draftCR:**

<begin>

5.3.7.2 Initiation

The UE initiates the procedure when one of the following conditions is met:

1. upon detecting radio link failure of the MCG and *t316* is not configured, in accordance with 5.3.10; or

<skip>

1> upon T316 expiry, in accordance with sub-clause 5.7.3b.5; or

1> upon receiving PC5-S release message from L2 U2N Relay UE for the PC5 link; or

1> upon reception of *NotificationMessageSidelink* including *indicationType* by L2 U2N Remote UE in RRC\_CONNECTED, in accordance with subclause 5.8.9.10.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

<end>

**Rapporteur comments:** It was agreed in RAN2 that re-establishment procedure will be triggered upon reception of PC5-S release message. A306 in RIL list proposed the following condition should be added in 5.3.7.2, which is **noted as ‘Prop agree’**.

1> upon reception of PC5-S release message from L2 U2N Relay UE in RRC\_CONNECTED

**Question 19a: Do companies agree to add ‘reception of PC5-S release message’ as initiation condition in A306?**

**Question 19b: Do companies agree to delete the following initiation condition proposed in [28]?**

* upon detecting sidelink radio link failure by L2 U2N Remote UE in RRC\_CONNECTED, in accordance with subclause 5.8.9.3

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| **Company** | **Agree to add?****(Yes or No)** | **Agree to delete?****(Yes or No)** | **Comments** |
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* + 1. R2-2205991

[34] R2-2205991 Clarification on relay and remote UE behavior during failure handling Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core

In [34], it mentioned that reception of *NotificationMessageSidelink* including *indicationType* triggers RRC re-establishment by remote UE in RRC\_CONNECTED. It is up to remote UE implementation whether to release or keep the unicast PC5 link. For the case that remote UE sends msg3 via old relay UE, [34] thinks the system information should be corresponding to the serving cell in which the relay UE does RRC reestablishment/HO successfully. So, the relay UE is not allowed to send forward system information of the old PCell upon Uu RLF/HO. Moreover, the relay UE can only send the system information of the new/target cell after its RRC reestablishment/HO success. This is to avoid a case that the remote UE has sent *RRCReestablishmentRequest* message to the relay UE while the relay UE fails to recover its RRC connection. In addition, the principle can be extended to the case that remote UE selects a new relay UE. In this case the relay UE is not allowed to send discovery message during RRC reestablishment/HO to avoid being selected by remote UE.

**Proposal 1: During Relay UE’s RRC reestablishment/HO, the Relay UE is not allowed to send discovery message or forward system information until RRC reestablishment/HO success.**

**Rapporteur comments:** It is reasonable that relay UE transmits discovery message or forward system information associated with new cell until RRC reestablishment/HO success. But it can be left for relay UE implementation.

**Question 20a: Do companies agree on the proposal 1 and changes in [34]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Agree on Change?****(Yes or No)** | **Comments** |
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[34] further pointed out that the remote UE stops T311 if it decides to maintain PC5 RRC connection upon reception of *NotificationMessageSidelink* from relay UE according to the current specification. However, since T311 is stopped before acquiring system information of new cell, if remote UE cannot receive system information from relay UE, there is no entry to end the RRC re-establishment procedure. Thus, like legacy Uu, T311 can be stopped after the remote UE receives system information of new cell from relay UE.

**Proposal 3: T311 is stopped after the remote UE receives system information of new cell from relay UE.**

**Question 20b: Do companies agree on the proposal 3 and changes in [34]?**

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| **Company** | **Agree on Proposal?****(Yes or No)** | **Agree on Change?****(Yes or No)** | **Comments** |
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* + 1. R2-2204962

[36] R2-2204962 TP on unsuitable relay during re-establishment Lenovo discussion Rel-17

[36] mentioned that according to section 7.1, ‘the (re)selected L2 U2N Relay UE becomes unsuitable’ is added as stop condition of T301 in sidelink relay topic. However, it has not been captured in the procedure text. In legacy, ‘the selected cell becomes unsuitable’ is a stop condition of T301, which is captured in 5.3.7.7 as follows. We propose that ‘the (re)selected L2 U2N Relay UE becomes unsuitable’ also can be captured in this section.

**Changes from TP:**

<begin>

5.3.7.7 T301 expiry or selected cell/relay no longer suitable

The UE shall:

1> if timer T301 expires;

1> if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 38.304 [20]; or

1. if the (re)selected L2 U2N Relay UE becomes no longer suitable according to the relay selection criteria as specified in TS 38.300 [2];

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with release cause 'RRC connection

<end>

**Question 21: Do companies agree on the changes in [36]?**

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| **Company** | **Agree on changes?****(Yes or No)** | **Comments** |
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* + 1. R2-2205132

[22] R2-2205132 Associating two sidelink RLC bearer configurations for bi-directional sidelink RLC bearer to support L2 U2N Relay ASUSTeK CR Rel-17 38.331 17.0.0 3053 - F NR\_SL\_relay-Core

In [22], it pointed out that in Rel-16, there is a 1-to-1 mapping between sidelink DRB and Tx/Rx sidelink RLC bearer configuration. However, in Rel-17 L2 U2N Relay, multiple Remote UE’s DRBs can be mapped to one Tx/Rx sidelink RLC bearer configuration. And, both remote UE and relay UE may receive multiple Tx sidelink RLC bearer configurations from gNB and multiple Rx sidelink RLC bearer configurations from each other. In this situation, it is not clear how remote UE/relay UE can know which two sidelink RLC bearer configurations among the multiple Tx sidelink RLC bearer configurations and the multiple Rx sidelink RLC bearer configurations should be associated for one bi-directional sidelink RLC bearer.

To ensure gNB uses the same value of sidelink RLC channel ID for both sidelink RLC bearer configurations, it is suggested to add related description on the field of sl-RLC-ChannelID.

**Changes from DraftCR:**

<begin>

6.3.5 Sidelink information elements

*<omitted>*

– SL-RLC-ChannelConfig

The IE *SL-RLC-ChannelConfig* specifies the SL RLC bearer configuration information for PC5 Relay RLC channel between L2 U2N Relay UE and L2 U2N Remote UE.

***SL-RLC-ChannelConfig* information element**

-- ASN1START

-- TAG-SL-RLC-RLC-CHANNEL-CONFIG-START

SL-RLC-ChannelConfig-r17 ::= SEQUENCE {

 sl-RLC-ChannelID-r17 SL-RLC-ChannelID-r17,

 sl-RLC-Config-r17 SL-RLC-Config-r16 OPTIONAL,

 sl-MAC-LogicalChannelConfig-r17 SL-LogicalChannelConfig-r16 OPTIONAL,

 sl-PacketDelayBudget-r17 INTEGER (0..1023) OPTIONAL,

 ...}

-- TAG-SL-RLC-CHANNEL-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SL-RLC-ChannelConfig* field descriptions** |
| ***sl-MAC-LogicalChannelConfig***The field is used to configure MAC SL logical channel paramenters. |
| ***sl-RLC-ChannelID***Indicates the PC5 Relay RLC channel in the link between L2 U2N Relay UE and L2 U2N Remote UE. Two PC5 Relay RLC channel configurations (one received from gNB and the other received from the peer UE) with the same value of *sl-RLC-ChannelID* are associated for a bi-directional sidelink RLC bearer. |
| ***sl-RLC-Config***Determines the RLC mode (UM, AM) and provides corresponding parameters. |
| ***sl-PacketDelayBudget***Indicates the Packet Delay Budget for a PC5 RLC bearer. Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms. |

<end>

**Question 22: Do companies agree on the changes in [22]?**

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| **Company** | **Agree on changes?****(Yes or No)** | **Comments** |
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* 1. **RemoteUEInformationSidelink and NotificationMessageSidelink**
		1. R2-2205907

[31] R2-2205907 [U456][U473] Draft CR on Corrections to Trigger Conditions of RemoteUEInformationSidelink InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core

In [31], it mentioned conditions for triggering the RemoteUEInformationSidelink message are not clearly specified for the case of IDLE/INACTIVE [U456]. Also, if the remote UE transitions from RRC\_CONNECTED to RRC\_IDLE/RRC\_INACTIVE, it may not send the SI request to reconfigure the SIs that the relay UE should monitor for updates.

**[U456] Proposal: The *RemoteUEInformationSidelink* message should be sent when transitioning to IDLE/INACTIVE, or when any of the information to be sent has changed.**

**Changes from DraftCR:**

<begin>

5.8.9.8.2 Actions related to transmission of *RemoteUEInformationSidelink* message

When entering RRC\_IDLE or RRC\_INACTIVE, or upon change in any of the information in the *RemoteUEInformationSidelink* while in RRC\_IDLE or RRC\_INACTIVE, the L2 U2N Remote UE shall:

1> include sl-Requested-SI-List in the RemoteUEInformationSidelink to indicate the requested SIB(s);

1> set *sl-PagingInfo-RemoteUE* as follows:

2> if the L2 U2N Remote UE is in RRC\_IDLE:

3> include *ng-5G-S-TMSI* in the *sl-PagingIdentity-RemoteUE*;

3> set *UE specific DRX cycle* to the value of UE specific Uu DRX cycle configured by upper layer in the *sl-PagingCycle-RemoteUE;*

2> else if the L2 U2N Remote UE is in RRC\_INACTIVE:

3> include *ng-5G-S-TMSI* and *fullI-RNTI* in the *sl-PagingIdentity-RemoteUE*;

3> set *UE specific DRX cycle* to the minimum value of UE specific Uu DRX cycles (configured by upper layer and configured by RAN) in the *sl-PagingCycle-RemoteUE;*

1> submit the *RemoteUEInformationSidelink* message to lower layers for transmission;

When entering RRC\_CONNECTED, if L2 U2N remote UE had sent *sl-Requested-SI-List* and *sl-PagingInfo-RemoteUE,* the L2 U2N Remote UE shall:

1> set the *sl-Requested-SI-List* to the value *release*;

1> set the *sl-PagingInfo-RemoteUE* to the value *release*;

1> submit the *RemoteUEInformationSidelink* message to lower layers for transmission;

<end>

**Rapporteur comments:** [U456][U473] are included in title and cover page. But U473 is not addressed in the draftCR.

**Question 23: Do companies agree on the proposal and changes in [31]?**

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| **Company** | **Agree on proposal?****(Yes or No)** | **Agree on changes?****(Yes or No)** | **Comments** |
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* + 1. R2-2205065

[19] R2-2205065 Correction on remote UE’s SIB(s) acquisition and paging monitoring ZTE, Sanechips CR Rel-17 38.331 17.0.0 3037 - F NR\_SL\_relay-Core

There are seven issues in [19]. The 6th issue is discussed in this section. [19] pointed out that the procedure in 5.8.9.10.4 is not aligned with agreement. According to agreement, 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.

**Change from DraftCR:**

<begin>

5.8.9.10.4 Actions related to reception of *NotificationMessageSidelink* message

Upon receiving the *NotificationMessageSidelink*, the U2N Remote UE shall:

1> if the *indicationType* is included:

2> if the UE is L2 U2N Remote UE in RRC\_CONNECTED:

3> initiate the RRC connection re-establishment procedure as specified in 5.3.7;

2> else if the UE is L3 U2N Remote UE, or L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE:

3> if the PC5-RRC connection with the U2N Relay UE is determined to be released:

4> perform the relay (re)selection as specified in 5.8.15.3.

3> else

4> maintain the PC5-RRC connection;

NOTE: For L3 U2N Remote UE, or L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE, it is up to Remote UE implementation whether to trigger relay (re)selection or keep the unicast PC5 link.

<end>

**Rapporteur comments:** after the remote UE receives the PC5-RRC notification message sent by relay UE due to, i.e., HO or cell (re)selection or Uu RLF, the re-establishment procedure is triggered. The remote UE performs relay/cell selection during re-establishment procedure if deciding to release. Therefore, ‘relay/cell (re)selection’ is captured in the section for re-establishment already. Therefore, ‘PC5 RRC connection release’ is captured in 5.8.9.10.4.

**Question 24: Do companies agree on the changes in [19]?**

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| **Company** | **Agree on changes?****(Yes or No)** | **Comments** |
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* + 1. R2-2205909

[33] R2-2205909 [U482] Draft CR on Corrections to NotificationMessageSidelink InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core

In [33] [U482], it mentioned in that relay UE RRC failure should only be sent in the case where the relay’s RRC connection establishment/resume is triggered by the remote UE’s establishment/resume.

**Changes from DraftCR:**

<begin>

5.8.9.10.3 Actions related to transmission of *NotificationMessageSidelink* message

The U2N Relay UE shall set the indication type as follows:

1> if the UE initiates transmission of the *NotificationMessageSidelink* message due to Uu RLF:

2> set the indicationType as relayUE-UuRLF;

1> else if the UE initiates transmission of the NotificationMessageSidelink message due to reconfiguration with sync:

2> set the indicationType as relayUE-HO;

1> else if the UE initiates transmission of the NotificationMessageSidelink message due to cell reselection:

2> set the indicationType as relayUE-CellReselection;

1> if the UE initiates transmission of the NotificationMessageSidelink message due to Uu RRC connection establishment failure in which the connection was triggered by a remote UE:

2> set the indicationType as relayUE-UuRRCFailure;

<end>

**WI RRC rapporteur comments from RIL list:** Not sure about the issue. It was agreed that during path switch to idle/inactive relay UE, the relay UE can send notification message if setup/resume fails.

**Question 25: Do companies agree on the changes in [33]?**

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| **Company** | **Agree on changes?****(Yes or No)** | **Comments** |
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* + 1. R2-2204958

[35] R2-2204958 [B103] TP for initiation condition of notification message Lenovo discussion Rel-17

[35] is saying that a L2 U2N relay UE may transmit notification message upon reception of handover command, which is not associated with CHO. In current specification, the U2N Relay UE can initiate the procedure upon reception of an *RRCReconfiguration* including the *reconfigurationWithSync.* However, CHO configuration is also included in *RRCReconfiguration* including the *reconfigurationWithSync.*

**Changes from TP:**

<begin>

5.8.9.10.2 Initiation

The U2N Relay UE can initiate the procedure when one of the following conditions is met:

1> upon Uu RLF as specified in 5.3.10;

1> upon reception of an *RRCReconfiguration* including the *reconfigurationWithSync not associated with CHO*;

1> upon cell reselection;

1> upon L2 U2N Relay UE’s RRC connection failure including RRC connection reject as specified in 5.3.3.5 and 5.3.13.10, and T300 expiry as specified in 5.3.3.7, and RRC resume failure as specified in 5.3.13.5;

<end>

**WI RRC Rapporteur comments in RIL list:** The issue is whether relay UE can be configured with conditional configuration for CHO.

**Question 26: Do companies agree on the changes in [35]?**

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| **Company** | **Agree on changes?****(Yes or No)** | **Comments** |
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* 1. **Other**

[6] R2-2204634 Correction on [O006, O007, O008, O010, O011, O054, O900] OPPO draftCR Rel-17 38.331 17.0.0 F NR\_SL\_relay-Core

[7] R2-2204674 [E083][H593] Two copies of a same SIB and related remote UE behaviour vivo discussion

[16] R2-2204989 Discussion on inter layer interaction for NR sidelink relay OPPO discussion Rel-17 NR\_SL\_relay-Core

**Rapporteur comments:** [6] [7] [16] will be handled in RIL list [602].

[12] R2-2204766 Discussion on the LCIDs of SL-SCH for Uu Logical Channels of Remote UE CATT discussion Rel-17 NR\_SL\_relay-Core

[17] R2-2204991 Correction to support L3 U2N Relay OPPO draftCR Rel-17 38.300 17.0.0 NR\_SL\_relay-Core

**Rapporteur comments:** Stage 3 CP issue will be discussed first in this summary. Therefore, [12] [17] are not included.

# 3 Conclusion

# References

1. R2-2204550 Discussion on paging information management for a remote UE SHARP Corporation discussion NR\_SL\_relay-Core
2. R2-2204551 Discussion on cell change of remote UE due to relay UE's cell change SHARP Corporation discussion NR\_SL\_relay-Core
3. R2-2204584 38.300 CR Correction for SL Relay MediaTek Inc. CR Rel-17 38.300 17.0.0 0440 - F NR\_SL\_relay-Core
4. R2-2204585 General SIB forwarding for Remote UE [M119][H629] MediaTek Inc. discussion Rel-17 NR\_SL\_relay-Core
5. R2-2204586 Positioning SIB forwarding for Remote UE [M119][H629] MediaTek Inc. discussion Rel-17 NR\_SL\_relay-Core
6. R2-2204634 Correction on [O006, O007, O008, O010, O011, O054, O900] OPPO draftCR Rel-17 38.331 17.0.0 F NR\_SL\_relay-Core
7. R2-2204674 [E083][H593] Two copies of a same SIB and related remote UE behaviour vivo discussion
8. R2-2204676 OOC concept for remote UE vivo discussion
9. R2-2204764 [C121] Necessity of Releasing the Paging Request of Remote UE via SidelinkUEInformationNR CATT discussion Rel-17 NR\_SL\_relay-Core
10. R2-2204765 [C122]Conditions of RemoteUEInformationSidelink Transmission CATT discussion Rel-17 NR\_SL\_relay-Core
11. R2-2204766 Discussion on the LCIDs of SL-SCH for Uu Logical Channels of Remote UE CATT discussion Rel-17 NR\_SL\_relay-Core
12. R2-2204886 Discussion on SI forwarding NEC Corporation discussion Rel-17 NR\_SL\_relay-Core
13. R2-2204959 [B104] TP on stop condition of T300 Lenovo discussion Rel-17
14. R2-2204960 [B105] TP on setup request procedure Lenovo discussion Rel-17
15. R2-2204961 [B106] TP on re-establishment procedure Lenovo discussion Rel-17
16. R2-2204989 Discussion on inter layer interaction for NR sidelink relay OPPO discussion Rel-17 NR\_SL\_relay-Core
17. R2-2204991 Correction to support L3 U2N Relay OPPO draftCR Rel-17 38.300 17.0.0 NR\_SL\_relay-Core
18. R2-2205064 Discussion on remote UE’s SIB(s) acquisition and paging monitoring ZTE, Sanechips discussion Rel-17 NR\_SL\_relay-Core
19. R2-2205065 Correction on remote UE’s SIB(s) acquisition and paging monitoring ZTE, Sanechips CR Rel-17 38.331 17.0.0 3037 - F NR\_SL\_relay-Core
20. R2-2205115 remaining issues for control plane procedure for relay operation LG Electronics France discussion Rel-17
21. R2-2205131 Connection establishment and resume failure occurrence to a L2 U2N Remote UE ASUSTeK CR Rel-17 38.331 17.0.0 3052 - F NR\_SL\_relay-Core
22. R2-2205132 Associating two sidelink RLC bearer configurations for bi-directional sidelink RLC bearer to support L2 U2N Relay ASUSTeK CR Rel-17 38.331 17.0.0 3053 - F NR\_SL\_relay-Core
23. R2-2205321 [X208] Discussion on remote UE’s on-demand SI in CONNECTED Xiaomi discussion
24. R2-2205496 Correction on cause value in sidelink relay Nokia, Nokia Shanghai Bell draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core
25. R2-2205609 Clarification of SI acquisition for RRC\_IDLE/RRC\_INACTIVE Remote UE (RIL#: E084, H593) Samsung discussion Rel-17 NR\_SL\_relay-Core
26. R2-2205695 [B100] SL Timer Broadcast in SIB1 Lenovo discussion NR\_SL\_relay-Core Revised
27. R2-2205699 [B212] RRC Connected Remote UE cannot acquire SIB1 Lenovo discussion NR\_SL\_relay-Core R2-2205695
28. R2-2205856 Correction for RRC Reestablishment in Sidelink relay Nokia, Nokia Shanghai Bell draftCR Rel-17 38.331 17.0.0 F NR\_SL\_relay\_enh-Core
29. R2-2205905 Draft CR on Corrections on Paging Reception by the Relay UE InterDigital draftCR Rel-17 38.304 17.0.0 NR\_SL\_relay-Core
30. R2-2205906 [U455] Draft CR on Corrections to Paging DRX Cycle InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core
31. R2-2205907 [U456][U473] Draft CR on Corrections to Trigger Conditions of RemoteUEInformationSidelink InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core
32. R2-2205908 [U465] Draft CR on Corrections to Relay UE Uu SI Request InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core
33. R2-2205909 [U482] Draft CR on Corrections to NotificationMessageSidelink InterDigital draftCR Rel-17 38.331 17.0.0 NR\_SL\_relay-Core
34. R2-2205991 Clarification on relay and remote UE behavior during failure handling Huawei, HiSilicon discussion Rel-17 NR\_SL\_relay-Core
35. R2-2204958 [B103] TP for initiation condition of notification message Lenovo discussion Rel-17
36. R2-2204962 [B107] TP on unsuitable relay during re-establishment Lenovo discussion Rel-17