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

**Online, February, 2022**

**Agenda item: 8.15.2**

**Source: OPPO**

**Title: Summary of open issue for SRAP**

**Document for: Discussion and Decision**

# Introduction

This document is for the following discussion

# Discussion

According to the left issues identified during [Post116bis-e][633][Relay] Relay open issues list (OPPO), the following questions are used to collect companies view.

|  |  |  |  |
| --- | --- | --- | --- |
| 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. |

**Q1: Do you agree to confirm the working assumption from 116b as follows?**

Working assumption:

Remote local UE ID is 8 bits.

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Qualcomm | Agree |  |
| Ericsson | agree |  |
| MediaTek | Agree |  |
| Intel | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Sharp | Agree |  |
| Spreadtrum | Agree |  |
| Nokia | Agree if majority as compromise | We can agree to the WA if majority agrees, but fail to see how this will solve any forward compatability issues as 8 bits seems somehow little even for multi-hop. Potentially, we could say 5 bits and 3 reserved? |
| Fujitsu | Agree |  |
| CATT | Agree |  |
| vivo | Agree |  |
| ZTE | Agree | During RAN3#114bis-e meeting, one working assumption has been reached that local UE ID may be unique per relay UE. If that is the case, the 8bits local remote UE ID is enough.  WA: the gNB-DU can include the gNB-DU F1AP UE ID of relay UE in the INITIAL UL RRC MESSAGE during the initial access of remote UE with local UE ID unique per relay UE. |

|  |  |  |  |
| --- | --- | --- | --- |
| 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. |

**Q2: Do you agree to confirm the working assumption from 116b as follows?**

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.

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Can remove the part of  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.~~ |
| Qualcomm | Agree | Agree with OPPO. |
| Ericsson | Agree | Agree with OPPO suggested changes |
| MediaTek | Agree |  |
| Intel | Agree |  |
| Huawei, HiSilicon | Agree | No need to change/re-open the previous agreement. |
| Apple | Agree |  |
| Sharp | Agree |  |
| Spreadtrum | Agree |  |
| Nokia | Agree | Agree with OPPO |
| Fujitsu | Agree |  |
| CATT | Agree | We share the same view as OPPO. |
| vivo | Agree | Agree with Huawei. |
| ZTE | Agree |  |

|  |  |  |  |
| --- | --- | --- | --- |
| O5.08 (together with content from Q1.03) | [FFS point from R2#116 agreement] SUI content to enable reporting the UE’s L2ID and discovery via SUI message to gNB by relay/remote UE | 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.  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  And also 2 EN in RRC running CR  Editor’s Note: RAN2 to further discuss whether an explicit indication in SUI is required to differentiate relay case and non-relay case when UE requests discovery configuration.  Editor’s Note: RAN2 to further discuss whether an explicit indication in SUI to request of Local remote UE by Relay UE is required.  And also there are questions related to UE ID update.  We have the corresponding open issue.  Rapp understand it is a general issue on how to report remote UE ID in SUI |

This general question on how to perform report in SUI relates to both communication (relay) and discovery (relay and non-relay).

Firstly, based on the following agreement, L2 relay UE need to report source L2 ID to gNB, moderator understand it should be the source ID of relay-related discovery transmission, since the usage of it is for gNB to know which relay UE is the target relay UE reported by source UE (after receiving the discovery message) using measurement report, yet good to confirm in R2

Proposal 9:[Easy]Relay UE in RRC\_CONNECTED reports its source L2 ID to gNB, via SidelinkUEInformationNR.

Besides, due to the following agreement from 116

Proposal 16: [21/22] RRC reconfiguration message towards the target Relay UE should include the Remote UE’s local ID/AL ID and L2 ID when preparing the direct-to-indirect path switch.

Moderator understand there is a need for L2 remote UE to report its source L2 ID to network, which is the ID to be used to establish PC5 link with target relay UE.

**Q3-1a: In SUI, for L2 relay scenario, in which case(s), the source ID should be reported?**

**Case-1a: L2 remote UE reporting source ID of relay-related discovery transmission**

**Case-1b: L2 remote UE reporting source ID of non-relay-related discovery transmission**

**Case-2a: L2 remote UE reporting source ID of established PC5 link with L2 relay UE**

**Case-2b: L2 remote UE reporting source ID to be used to establish PC5 link with L2 relay UE**

**Case-3a: L2 relay UE reporting source ID of relay-related discovery transmission**

**Case-3b: L2 relay UE reporting source ID of non-relay-related discovery transmission**

**Case-4: L2 relay UE reporting source ID of established PC5 link with L2 remote UE**

|  |  |  |
| --- | --- | --- |
| **Company** | **Case(s)** | **Comment** |
| OPPO | 2b, 3a | 1b/3b for non-relay discovery is not needed since LTE.  3a is needed since that is the ID remote UE can measure before switching, and gNB can use that ID to configure the remote UE on the target relay UE to switch to.  2b is needed so that gNB can configured the target relay UE on the incoming remote UE before PC5 link establishment for local ID and egress RLC channel.  1a is not needed because the source ID for remote UE discovery transmission is used for discovery solicitation message, which may or may not be the same as 2b, so reporting of 2b is enough.  2a and 4 are not useful since the Ids for eastablished link is not useful for gNB configuration |
| Qualcomm | 1a, 3a | We agree with OPPO’s comments on relay UE part to use source L2 ID on discovery (i.e. 3a).  For remote UE, we prefer to align with relay UE to use source L2 ID on discovery (i.e. 1a). In our understand, L2 ID to be used to establish PC5 link sounds strange because remtoe UE (directly connected to gNB) even don’t know whether NW will handover it to another cell or a relay. Then, does it mean remote UE directly connected to gNB needs to prepare its L2 ID in advance, even if it doesn’t know whether source will handover it to a relay (and doesn’t know which relay UE to switch)? Instead, remote UE should always have L2 ID for discovery avaiable, as long as it supports L2 relay. And the L2 ID for discovery is not coupled to the target relay UE.  [OPPO] according to our S2 colleague, the two ” **source ID of relay-related discovery transmission**” and ” **source ID to be used to establish PC5 link with L2 relay UE**” are not necessarily the same, and there are proposal in the coming S2 meeting to mandarate the two to be different. So in R2, seems we cannot assume the two to be the same.  **[QC] We agree that these 2 source L2 ID can be different. However, the intention for remote UE to report its source L2 ID is just for gNB to indentify it during direct-to-indirect path switch, right? Then, source L2 ID for discovery is more suitable because it is irresptive of which target relay UE.**  [OPPO] After offline with QC, i assume the common ground is 1) the ID for 1a and for 2b can be same and can be different, 2) the ID reported to network has to be the ID that remote UE use for the transmission of DCR message, 3) the ID may be decided / changed by remote UE when a path switching is to be initiated. Is that the common view by others? |
| Ericsson | 1a, 3a | We share the concern raised by Qualcomm, although as OPPO pointed out, that disvoery ID and the ID to establish PC5 link with L2 relay UE may be different potentially, however, we think it is sufficient to have both Ids to be the same. |
| MediaTek | 1a, 3a | We agree with Qualcomm’s comments, take direct-to-indirect path switch to IDLE relay UE case as example, in this case, a remote UE should first perform relay-related discovery to find relay UE and then gNB can tell relay UE remote UE’s ID to establish PC5 link. |
| Intel | 2b, 3a | We understand OPPO’s point that the source ID may be different (although we have not found explicit indication in SA2 TS 23.304) and think it is probably safer to use 2b. For direct-to-indirect scenario, since the Remote UE was connected to the gNB, it can provide the source ID that it intends to use for PC5 link that the gNB can use. Having said that, we are fine with 1a as well as it makes practical sense for Remote UE to use the same ID for both relay discovery and PC5 link. |
| Huawei, HiSilicon | 2b, 3a | Share the views from rapportuer.  **But**, do we really need to specify the L2 ID reporting from remote UE? For direct-to-indirect path switch, the 1st UL SRAP data from remote UE will include local ID. Relay UE can identify the remote UE by the local ID. Why does relay UE need to know the L2 ID of the coming remote UE?  **[QC] The intention is to include it in RRCReconfiguration message towards target relay UE, as agreed in RAN2#116-e:**  Proposal 16: [21/22] RRC reconfiguration message towards the target Relay UE should include the Remote UE’s local ID/AL ID and L2 ID when preparing the direct-to-indirect path switch.  **It is not for SRAP.**  [Huawei]: Yes, my point is ”L2 ID” in the above agreement @116 is useless, since we agree the local ID carrid in PC5 SRAP @116bis. |
| Apple | 3a, 1a(?) | I share the same view of Qualcomm that remote UE cannot predict the Src L2 ID to be used in PC5 in the future. Such an ID is only generated when the UE wants to send DCR message (PC5-S signaling) to anothe SL UE (i.e., relay UE)  But I also doubt that a remote UE has always has Src L2 address available in Case 1a, because remote UE may just doing model-A discovery and does not need a L2 Src ID for discovery message transmisison. In my opinion, the Src L2 ID is generated on-demand, and is not to be used as a permanent identifier of remtoe UE. |
| Sharp | 2b, 3a | Agree with OPPO based on the understanding of different source L2 IDs for discovery and PC5 link establishment. If it can be limited to be the same, we are also fine to follow the majority’s view. |
| Spreadtrum | 1a,3a | Agree with Qualcomm. |
| Nokia | 1a, 3a |  |
| Fujitsu | 1a, 3a | Agree with Qualcomm. |
| CATT | 3a | We share the same understanding as rapp’s latest reply as below:  1) the ID for 1a and for 2b can be same and can be different,  2) the ID reported to network has to be the ID that remote UE use for the transmission of DCR message,  3) the ID may be decided / changed by remote UE when a path switching is to be initiated. |
| vivo | 2b, 3a | Share the similar views from rapportueur.  About 1a and 2b, we think the reporting time point is different. Relay-related discovery transmission by remote UE occurs before triggering PC5 link establishment with L2 relay UE, e.g. send DCR message. If these two source L2 IDs of remote UE are same, both 1a and 2b are feasible. 1a is more preferable because of earlier time. If these two source L2 IDs are different, only 2b is feasible since 2b can be used to identify a remote UE in a relay architecture. Also, 2b is needed at least for the Local remote UE ID linkage to Remote UE L2 ID in the D2I path switch case (as what QC clarified above). |
| ZTE | 3a | 3a) should be supported since the gNB may correlate the remote UE’s measurement report of candidate relay which include the source ID for discovery of relay UE based on the L2 relay UE reporting source ID of relay-related discovery transmission.  With regard to 2b, we tend to share Huawei’s view that relay UE could identify the remote UE based on the gNB allocated local remote UE ID in SRAP subheader and the PC5 RLC channel configuration at relay UE should also include the local remote UE ID. |

For L3 relay and L3 remote UE, the reporting of source ID seems not very necessary, considering they are not needed in legacy LTE L3 relay scheme.

**Q3-1b: Do you agree there is no need for L3 relay UE or L3 remote UE to report its source ID (for discovery and for communication) to network?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Same as LTE |
| Qualcomm | Agree | Same as LTE |
| Ericsson | agree | Same as LTE |
| MediaTek | Agree |  |
| Intel | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Sharp | Agree |  |
| Spreadtrum | Agree |  |
| Nokia | Agree |  |
| Fujitsu | Agree |  |
| CATT | Agree |  |
| vivo | Agree |  |
| ZTE | Agree |  |

And there was comment raised during post-116b that there might be cases where the source ID is updated/changed by UE autonomously, so the question is whether there is left issue to handle in such case. Moderator understands

1) There is no requirement in TS 23.304 on source ID update for discovery transmission (related to 1a/1b/3a/3b of Q3-1a).

2) And for source ID for communication, there is indeed requirement for established unicast link, for which case (related to case-2a and case-4 in Q3-1a),

if companies believe the reporting is needed, a further report on the updated ID is sufficient, i.e., no left issue.

**Q3-1c: Do you agree there is no left issue for source ID update (for the cases to be concluded from Q3-1a)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | The only related case is 3a in Q3-1a, where the report on source-ID is sufficient. |
| Qualcomm | See comments | We think it is better to clarify when remote UE and relay UE in CONNECTED state will report its L2 ID. In our understanding, the timing is:   1. Determine to support L2 relaying and initiate discovery 2. Determine to stop L2 relaying support and suspend discovery 3. Link layer ID updated due to any reason   [OPPO] 1 and 2 seems similar to the current spec for communication, rapp understand it is straightforward. For 3, it relies on the output from 1a (for communication), and if it is for discovery, rapp understand there is no spec in S2 saying link layer ID update is applicable to discovery as well. |
| Ericsson | comments | Agree with Qualcomm, 3) seems need to be captured in the spec, regarding ”conditions” when L2 ID report needs to be performed |
| MediaTek |  | Agree with Qualcomm |
| Intel | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | No | We agree with Qualcomm that Src L2 ID change has to be considered and UE need trigger reporting in those cases.  Also, For the case of 3a), the current SUI reporting is insufficient because the remote UE’s report of measurements may be assocaited with an old L2 Src ID used by IDLE/INACTIVE relay UE, and relay UE may change its Src L2 ID and enter RRC\_CONNECTED. In this case, the gNB cannnot associate the measurement reports with the relay UE context of new Src L2 ID. So, we suggest to enhance SUI to require UE to report its last used Src L2 ID as an additoanl parameter to assist gNB to correctly evaluate the relay UE candidate. |
| Sharp | See comments | Clarify source L2 ID should be reported when source L2 ID updated due to any reasons. For groupcast and broadcast, UE also may change source L2 ID when Application Layer ID changes or the privacy protect timer expires, although only unicast needs link identifier update procedure to inform the peer UE. |
| Spreadtrum | Agree |  |
| Nokia | Agree |  |
| Fujitsu | Agree |  |
| CATT | Agree |  |
| vivo | Comments | Besides potential agreed triggers in Q3-1a, we think source ID update needs to be reported timely. This hasn’t been something already supported in the RRC Spec. |
| ZTE | Agree |  |

For destination ID report, w.r.t the necessary, it relates to the possibility of doing mode-1 scheme, i.e., using the index in SUI to generate BSR. Then the only doubt is at L2 remote UE, since it has been agreed that

Proposal 1: In this release, for L2 U2N relay, remote UE can’t be configured to use CG type 1 of RA Mode 1 if relay connection has been setup

**Q3-2a: In SUI, for L2/L3 relay scenario, in which case(s), the destination ID should be reported?**

**Case-1a: L2 remote UE reporting destination ID of relay-related discovery transmission**

**Case-1b: L2 remote UE reporting destination ID of non-relay-related discovery transmission**

**Case-2: L2 remote UE reporting destination ID of established PC5 link with L2 relay UE**

**Case-3a: L2 relay UE reporting destination ID of relay-related discovery transmission**

**Case-3b: L2 relay UE reporting destination ID of non-relay-related discovery transmission**

**Case-4: L2 relay UE reporting destination ID of established PC5 link with L2 remote UE**

**Case-5a: L3 remote UE reporting destination ID of relay-related discovery transmission**

**Case-5b: L3 remote UE reporting destination ID of non-relay-related discovery transmission**

**Case-6: L3 remote UE reporting destination ID of established PC5 link with L3 relay UE**

**Case-7a: L3 relay UE reporting destination ID of relay-related discovery transmission**

**Case-7b: L3 relay UE reporting destination ID of non-relay-related discovery transmission**

**Case-8: L3 relay UE reporting destination ID of established PC5 link with L3 remote UE**

|  |  |  |
| --- | --- | --- |
| **Company** | **Case(s)** | **Comment** |
| OPPO | 1a,1b,3a,3b,5a,5b,7a,7b  4,6,8 (i.e., except 2) | 1a,1b,3a,3b,5a,5b,7a,7b are for discovery transmission, which has been agreed  4,6,8 are needed since they can work in mode-1  2 is not needed since it cannot work in mode-1 anyway |
| Qualcomm | Agree with OPPO | Agree with OPPO |
| Ericsson | Agree with OPPO |  |
| MediaTek | Agree with OPPO |  |
| Intel | Agree with OPPO |  |
| Huawei, HiSilicon |  | We don’t need further agreement. This is just clarificaiton/interpretation on the agreement ”for L2 U2N relay, remote UE can’t be configured to use CG type 1 of RA Mode 1”.  We acctually produced significant agremments for SL relay. Let’s not further agree something if it can be derived from existing agreement. |
| Apple | Same view as OPPO |  |
| Sharp | Agree with OPPO |  |
| Spreadtrum | Agree with OPPO |  |
| Nokia | Agree with OPPO |  |
| Fujitsu | Agree with OPPO |  |
| CATT | Same view as OPPO. |  |
| vivo | Agree with OPPO |  |
| ZTE | Agree with OPPO |  |

For discovery, there is an agreement from 116b as follows

Proposal 3.2: [19/20] SUI includes an indication of whether a particular destination L2 ID is associated to discovery.

Based on the running-CR discussion, one open issue identified is that whether there is a need to further differentiate between relay and non-relay discovery on top of the indication agreed above.

Moderator understand the source of this is that the dedicated configuration of threshold-based relay configuration is included in dedicated signaling, proponent tend to use this indication for network to decide whether to provide threshold related relay-related discovery configuration.

**Q3-2b: In SUI, when reporting a particular destination L2 ID associated with discovery (related to case-1a/1b/3a/3b/5a/5b/7a/7b of Q3-2a), is there an need to further report explicit relay type info, i.e., relay-discovery and non-relay-discovery, to differentiate between the two?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Needed / not-needed** | **Comment** |
| Qualcomm | See comments | In our understanding, the intention to introduce discovery destination ID reporting is for gNB to differentiate whether coming BSR for discovery or communication. From this perspective, it seems no need to introduce explicit indication on whether it is relay discovery or non-relay. However, since it is a minor issue, we can agree if majority prefer. |
| Ericsson | no | Relay discovery and non relay discovery use the same SRB and the same resource pool, therefore, gNB doesn’t need to treat them differently. |
| MediaTek | Not-needed |  |
| Intel | Not needed | Agree with Ericsson’s comment |
| Huawei, HiSilicon | Needed |  |
| Apple | no |  |
| Sharp | No | Agree with Ericsson. |
| Spreadtrum | No |  |
| Fujitsu | Not needed |  |
| CATT | No |  |
| vivo | No |  |
| ZTE | No |  |

Then for the cases of reporting destination ID, there is one left issue in Pre-116b summary unhandled, i.e., P5 of R2-2200943.

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

Moderator understand it is a general question applicable to L2/L3, relay/remote and communication/discovery case.

The background of this question is there is an existing IE in SUI message as follows

SL-TxResourceReqList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReq-r16

SL-TxResourceReq-r16 ::= SEQUENCE {

sl-DestinationIdentity-r16 SL-DestinationIdentity-r16,

sl-CastType-r16 ENUMERATED {broadcast, groupcast, unicast, spare1},

sl-RLC-ModeIndicationList-r16 SEQUENCE (SIZE (1.. maxNrofSLRB-r16)) OF SL-RLC-ModeIndication-r16 OPTIONAL,

sl-QoS-InfoList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIsPerDest-r16)) OF SL-QoS-Info-r16 OPTIONAL,

sl-TypeTxSyncList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-TypeTxSync-r16 OPTIONAL,

sl-TxInterestedFreqList-r16 SL-TxInterestedFreqList-r16 OPTIONAL,

sl-CapabilityInformationSidelink-r16 OCTET STRING OPTIONAL

}

And in LTE SUI message, the relay and non-relay cases are differentiated (there is no destination report for discovery in LTE SUI since there discovery is carried via MAC transparent mode using PSDCH)

SidelinkUEInformation-r12-IEs ::= SEQUENCE {

commRxInterestedFreq-r12 ARFCN-ValueEUTRA-r9 OPTIONAL,

commTxResourceReq-r12 SL-CommTxResourceReq-r12 OPTIONAL,

discRxInterest-r12 ENUMERATED {true} OPTIONAL,

discTxResourceReq-r12 INTEGER (1..63) OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SidelinkUEInformation-v1310-IEs OPTIONAL

}

SidelinkUEInformation-v1310-IEs ::= SEQUENCE {

commTxResourceReqUC-r13 SL-CommTxResourceReq-r12 OPTIONAL,

commTxResourceInfoReqRelay-r13 SEQUENCE {

commTxResourceReqRelay-r13 SL-CommTxResourceReq-r12 OPTIONAL,

commTxResourceReqRelayUC-r13 SL-CommTxResourceReq-r12 OPTIONAL,

ue-Type-r13 ENUMERATED {relayUE, remoteUE}

} OPTIONAL,

discTxResourceReq-v1310 SEQUENCE {

carrierFreqDiscTx-r13 INTEGER (1..maxFreq) OPTIONAL,

discTxResourceReqAddFreq-r13 SL-DiscTxResourceReqPerFreqList-r13 OPTIONAL

} OPTIONAL,

discTxResourceReqPS-r13 SL-DiscTxResourceReq-r13 OPTIONAL,

discRxGapReq-r13 SL-GapRequest-r13 OPTIONAL,

discTxGapReq-r13 SL-GapRequest-r13 OPTIONAL,

discSysInfoReportFreqList-r13 SL-DiscSysInfoReportFreqList-r13 OPTIONAL,

nonCriticalExtension SidelinkUEInformation-v1430-IEs OPTIONAL

}

And BSR report use the index of these list sequentially to define destination index

NOTE 1: When configuring *commTxResourceReq*, *commTxResourceReqUC*, *commTxResourceReqRelay* and *commTxResourceReqRelayUC*, E-UTRAN configures at most *maxSL-Dest-r12* destinations in total (i.e. as included in the four fields together).

**Q3-2c: For the destintion ID to be reported (as to be concluded based on Q3-2a), which option is preferred**

**Option 1: Add a new IE**

**Option 2: Reuse the existing field *sl-DestinationIdentity*, in addition, introduce an indicator indicating that the destination ID is for transmission for discovery / transmission to remote UE / transmission to relay UE**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 | A cleaner solution as in LTE. |
| Qualcomm | 1 | Same view as OPPO |
| Ericsson | 1 | Agree with OPPO and Qualcomm |
| MediaTek | 1 |  |
| Intel | 1 |  |
| Huawei, HiSilicon | 2 | There is no accutally difference among those options. Why can’t be left to running CR rapporteur? |
| Apple | 2 | Because the ”destination index” space is still a unified index in SL BSR, introducing another destination list will need RAN2 to explain how to count two different destination lists to generate the Destination index. We would rather to use Option 2. |
| Sharp | 1 |  |
| Spreadtrum | 1 |  |
| Nokia | 1 | Agree with OPPO, this seems like a cleaner solution |
| Fujitsu |  | Can follow the majority. |
| CATT | 2 | If option1 will introduce more spec explaination work raised by Apple, considersing the time limitation, we prefer option2. |
| vivo | 1 |  |
| ZTE | 1 | The relay’s report of destination L2 ID of remote UE actually involves the local remote UE ID request. It is suggested to differentiate it from the normal destination ID report. |

Due to the EN in 331 running-CR, one left issue is as follows

Editor’s Note: RAN2 to further discuss whether an explicit indication in SUI to request of Local remote UE by Relay UE is required.

**Q3-2d: When report destination ID of peer UE as L2 remote UE (case-4 of Q3-2a), do you agree to report an indicator on whether local ID allocation is required.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| Qualcomm |  | This question is related to Q3-2e. If Option-1a is agreed for Q3-2e, it seems no need to have explict indicator |
| Intel | See comment | Based on our understanding, if option 1 is chosen for Q3-2c, then, this separate indicator is not needed. |
| Huawei, HiSilicon | Agree | Even if there is no update L2 reproting, the SUI should indicate the destination L2 ID is for remote UE, which requires local ID, rather than for legacy V2X UE.  Also, it seems only remote UE to be going to connected mode requries this local ID. |
| vivo | Comments | Rely on the conclusion of Q3-2c. If option 1 is agreed, separate indicator is not needed. |
| ZTE | Agree | Considering the L2 ID of remote UE may change from time to time, it is necessary to indicate whether new local remote UE ID should be allocated when relay UE report the L2 ID of remote UE. Otherwise, it is necessary to send the mapping between previously allocated local remote UE ID and new L2 ID of remote UE to gNB, which may be used by gNB to determine it is not necessary to allocate new local remote UEID for this new L2 ID of remote UE. |

Then there is another issue related to how to handle L2 ID change procedure, as included in the pre-116b summary

Proposal 12 (low priority) It is up to Relay UE implementation to handle the exceptional case where the PC5 unicast link L2 ID update procedure and local Remote UE ID update procedure coincide. FFS whether a note needs to be added in the spec.

Proposal 13 (low priority) During DST L2 ID update procedure, to avoid allocating the local ID for same remote UE again, it is suggested to include the allocated remote UE’s local ID in SUI message.

The background of this is in TS 23.304 (S2 spec for ProSe), there is L2 ID update for unicast link (so that the IDs of the two UEs in the same unicast link change).

Moderator understand that

- At relay UE side, it has to be aware of the association between old and new L2 ID, so that if network configuration for the old L2 ID arrives after L2 ID updated, the configuration is still valid;

- At network side, it has to be aware of the association between old and new L2 ID, so that it would not take a PDCP PDU for an old remote UE as for an new remote UE

To achieve this

1) P12 suggest no new signaling or normative impact, i.e., it leaves to relay-UE / network implementation to handle it

2) P13 suggest new signlaing and normative impact, i.e., it relies on the report by relay-UE to associate between old and new L2 ID

**Q3-2e: If one selected case-4 of Q3-2a, which option is preferred to handle the L2 ID update issue**

**Option-1a: No new signaling, relay-UE would not report the updated ID of remote UE**

**Option-1b: No new signaling, relay-UE would report the updated ID of remote UE**

**Option-2: Introduce new signaling for relay-UE to report the association between old and new ID of remote UE**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1a | 1b is not feasible since network cannot differentiate between whether the reported new L2 ID is for an old remote UE for a new remote UE, so has to allocate new local ID for it anyway, and when transmitting / receiving a SRAP PDU with the new local ID, hard to decide which PDCP entity to use.  2 is not needed since as long as the relay-UE does not report the new ID, there is no ambiguity at network side, and relay UE itself can be aware of the association anyway. |
| Qualcomm | 1a | 1a is sufficient. gNB can just assign a new one, irrespective whether it assigned an old one or not before. We don’t see issue. |
| Ericsson | 1a | From the relay UE perspective, 1a is sufficient. Since remote UE will anyway report its L2 Id to the gNB, so, the gNB can understand the assoiciation relation between the new L2 id of the remote UE and the local ID. |
| MediaTek | 1a |  |
| Intel | 1a |  |
| Huawei, HiSiliocn | 1a | This seems same as R16. |
| Apple | 2 | In principle, the remote UE shall not hide the L2 Destination Ids from the gNB. We think 1a is an makeshift solution with risk. We prepfer to have a clean solution for this problem. |
| Sharp | 1a |  |
| Spreadtrum | 1a |  |
| Nokia | 1a | At least new signalling is not needed at gNB side since as OPPO states, if gNB does not know about any new ID, there should not be an issue |
| Fujitsu | 1a |  |
| CATT | 1a |  |
| vivo | 1a |  |
| ZTE | See comment | If the proposal in Q3-2d is agreed, it is not necessary to design other new signalling to solve the issue mentioned in P13. To be specific, when relay UE report the updated L2 ID of remote UE, it may indicate to gNB that it does not request a new local ID for this remote UE.  If the proposal in Q3-2d is not agreed, a solution is necessary to solve the duplicated local remote UE ID allocation. We agree with Apple that the makeshift solution may bring up risk. In this sense, option 2 is better. |

|  |  |  |  |
| --- | --- | --- | --- |
| 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. |

In the current running CR, the error data handling is captured as follows

When a SRAP Data PDU that contains a UE ID or BEARER ID which is not included in *sl-SRAP-Config-Remote* (for Remote UE) or *sl-SRAP-Config-Relay* (for Relay UE) is received, the SRAP entity shall:

- discard the received SRAP Data PDU.

**Q4: Do you agree with the current running-CR above on error data handling?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Qualcomm | Agree |  |
| Ericsson | agree |  |
| MediaTek | Agree |  |
| Intel | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | Agree |  |
| Sharp | Agree |  |
| Spreadtrum | Agree |  |
| Nokia | Agree |  |
| Fujitsu | Agree |  |
| CATT | Agree |  |
| vivo | Agree |  |
| ZTE | Agree |  |

|  |  |  |  |
| --- | --- | --- | --- |
| O5.10 | [From companies input] How for RRC\_INACTIVE/RRC\_IDLE Relay to get local ID from remote UE direct-to-indirect switching | Pre117-e-offline | Based on company input here |

This issue was raised in Post-116b discussion, i.e., from Relay-UE perspective, it would receive the first message from the moving remote UE on SRB1, with SRAP header, where the UE ID was configured by network to Remote-UE within path switching command. Then there seems an issue on how for relay-UE to get local ID of remote UE, from the SRAP Data PDU (received from PC5 interface) header , or from network configuration as during normal RRC connection setup.

Moderator understand that the egress RLC channel configuration is needed for relay UE in such scenario anyway, so the only point to debate is whether the local ID configuration can be saved, meaning relay-UE relies on the SRAP Data PDU to get it

-- ASN1START

-- TAG-SL-SRAP-CONFIG-START

SL-SRAP-Config-r17 ::= SEQUENCE {

sl-LocalIdentity-r17 INTEGER (0..255) OPTIONAL, -- Need M

sl-MappingToAddModList-r17 SEQUENCE (SIZE (1..maxLC-ID)) OF SL-MappingToAddMod-r17 OPTIONAL, -- Need M

sl-MappingToReleaseList-r17 SEQUENCE (SIZE (1..maxLC-ID)) OF [SL-E2E-RB-Ientity-r17] OPTIONAL, -- Need M

...

}

SL-MappingToAddMod-r17 ::= SEQUENCE {

sl-RemoteUE-RB-Identity-r17 CHOICE {

srb-Identity-r17 SRB-Identity,

drb-Identity-r17 DRB-Identity

},

sl-Egress-RLC-Channel-Uu-r17 LogicalChannelIdentity OPTIONAL, -- L2RelayUE

sl-Egress-RLC-Channel-PC5-r17 SL-RLC-BearerConfigIndex-r16 OPTIONAL, -- Need N

...

}

-- TAG-SL-SRAP-CONFIG-STOP

-- ASN1STOP

**Q5: For RRC\_INACTIVE / RRC\_ILDE Relay UE, how for it to get local ID configuration for remote UE during direct-to-indirect switching?**

**Option-1: Take the UE ID in SRAP PDU (received from PC5 interface) for usage, so the configuration by network on *sl-LocalIdentity-r17* can be saved**

**Option-2: The configuration by network on *sl-LocalIdentity-r17* cannot be saved, i.e., the relay UE behaviour is the same as normal RRC connection setup**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 | Network implementation would ensure the local ID configuration to remote UE and to relay UE aligns with each other, as for normal RRC connection setup scenario, i.e., there is no need to differentiate the behavior between different scenarios. |
| Qualcomm | 2 | Same view as OPPO. We also prefer to have unified procedure on remote UE local ID assignment as RRC connection setup. |
| Ericsson | 2 | Agree with OPPO |
| MediaTek | 2 |  |
| Intel | 2 |  |
| Huawei, HiSilicon | 2 | Local ID itself only is uselees, without the the assocaiate bearer mapping (SL-MappingToAddMod) configured for relay. |
| Apple | Comment | We do not underdtand the question about ” **get local ID configuration from remote UE”** part. If the local ID is to be obtained “from” remote UE, then Only Option 1 is feasible. |
| Sharp | 2 |  |
| Spreadtrum | 2 |  |
| Nokia | 2 |  |
| Fujitsu | 2 |  |
| CATT | 2 |  |
| vivo | 2 |  |
| ZTE | 2 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| O5.11 | [FFS point from R2#116 agreement] Agreement: Any spec impact for RLC channel split between Uu DRB and Uu SRB | Pre117-e-offline | Due to the RAN2#116 agreement  As in Uu, a Uu DRB and a Uu SRB are mapped to different RLC channels (i.e., PC5 RLC channel and Uu RLC channel). FFS if there is any spec impact.  We have the open issue. |

In 116, the following agreement was reached, and thus the bearer ID field as concluded as 5-bit.

Agreement:

As in Uu, a Uu DRB and a Uu SRB are mapped to different RLC channels (i.e., PC5 RLC channel and Uu RLC channel). FFS if there is any spec impact.

Yet there is an issue raised during post-116b that since when relay UE receives a SRAP PDU (from PC5 interface, or from Uu interface) with bearer ID of 0/1/2/3, it cannot know whether the SRAP PDU is for DRB or for SRB, it cannot derive which egress RLC channel to use.

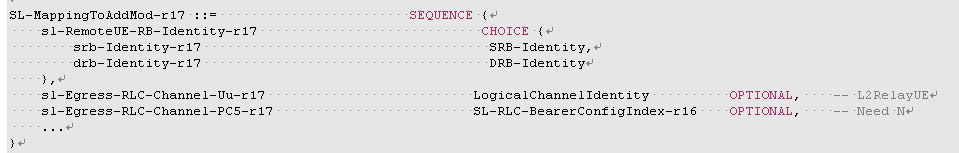
After some offline, moderator understand the solution is simply to enable an input for relay UE to differentiate between ingress RLC channel for SRB and DRB, explicitly/implicitly via CP or UP.

**Q6: How for relay UE to differentiate between SRAP data PDU for SRB and DRB if the BEARER ID is 0/1/2/3**

**Option-1 (explicit CP method): to introduce an explicit configuration from network to relay UE, on ingress RLC channel(s) split between SRB and DRB**

**Option-2 (explicit UP method): to add an 1-bit field in SRAP Data PDU, to differentiate between SRB and DRB**

**Option-3 (implicit CP method): reuse the signalling of *SL-SRAP-Config*, i.e., take *sl-Egress-RLC-Channel-Uu* and *sl-Egress-RLC-Channel-Uu* as ingress RLC channel as well (e.g., for a SRAP Data PDU received from PC5 via *sl-Egress-RLC-Channel-Uu*, relay UE can know whether it is SRB or DRB based on the associated *sl-RemoteUE-RB-Identity*)**



|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1,3 | 1 and 3 align with the previous agreement, i.e., to split RLC-channels between the ones for SRB and DRB, so that no need to introduce additional bit in SRAP Data PDU format. The only difference is that 1 requires new Uu signaling, while 2 does not, yet would put more restriction on ingress RLC channel selection.  2 is also a feasible way-out, we can follow majoirty view if 2 is preferred. |
| Qualcomm | ~~None~~ 3 | We are still confused what is the issue to resolve?   * When bearer ID is 0, specified config is used for SRB0 and dedicated config is used for DRB0. Relay UE can differentiate them via whether it is specified config or not * When bearer ID is 1   + If RRCRestablishment/RRCResume, default config is used for SRB1 while dedicated config is used for DRB1. Relay UE can differentiate them via whether it is specified config or not   + If not RRCRestablishment/RRCResume, remote UE should have received Gnb dedicated configuration on bearer mapping, irrespective whether it is SRB1 or DRB1. SO, it can still differentiate them via their different bearer mapping configurations received in previous Uu RRC message. * When bearer ID is 2   + Remote UE should have received Gnb dedicated configuration on bearer mapping, irrespective whether it is SRB2 or DRB2. SO, it can still differentiate them via their different bearer mapping configurations received in previous Uu RRC message. * When bearer ID is 3   + There is no SRB3 in relay because SN is not supported in the scoping.   [OPPO] it is not about which configuration to use, it is about how to decide on the egress RLC channel by relay UE, since that for a same BEARER-ID x in SRAP PDU header, it may be either for SRB x or DRB x, for which different RLC channel are to be used, how for relay UE to differentiate between the two => that is the key issue.  [QC] OK. We can change our position to Option 3 clarified by Huawei. However, we don’t need explicitly specify the relay UE behavior in RRC spec, right? Then, can we suggest to modify Huawei’s version as:  **The RB type of a SRAP PDU (i.e. SRB or DRB) is determined by relay UE, based on the CHOICE type of *sl-RemoteUE-RB-Idenntify-r17* associated with the ingress PC5/Uu RLC channel of this SRAP PDU. No spec impact is foreseen**  [Huawei]: We have no strong view on spec impact. But, it seems we need to assume SRAP layer knows the RB type of each received SRAP data based on the option3. |
| Ericsson | 3 | 1 and 2 are not aligned with RAN2 agreements. How to map a RB to an egress RLC channel is fully up to gNB configuration. There is no need to do any extra split in the RLC channel space. The issue can be left to RRC CR discussion to address, i.e., use a note in the RRC spec or use the signaling configuration. |
| MediaTek | 3 |  |
| Intel | 3 |  |
| Huawei, HiSilicon | 3 | **Option 3 should be clarified as:**  **The RB type of a SRAP PDU (i.e. SRB or DRB) is determined by relay UE, based on the CHOICE type of *sl-RemoteUE-RB-Idenntify-r17* associated with the ingress PC5/Uu RLC channel of this SRAP PDU.**  **[OPPO] Q: does this change mean that, e.g., for UL and for a specific DRB, for relay UE, it will get the SRAP PDU from remote UE via 1) exactly the egress RLC channel as in *sl-Egress-RLC-channel-PC5-r17* for the concerned DRB, or 2) does NOTE have to be the egress RLC channel as in *sl-Egress-RLC-channel-PC5-r17* for the concerned DRB, but can be *another* RLC channel, as long as its “CHOICE type of *sl-RemoteUE-RB-Idenntify-r17*” is DRB?**  **[Huawei]: 1) Not have to be the “concern DRB” ID, but just need to be DRB type of RB. 2) Yes. This is to only restrict the RB type but not DRB ID.** |
| Apple | 3 | Option 3. We also agree with the comment from Huawei |
| Sharp | 3 |  |
| Spreadtrum | 3 |  |
| Nokia | 3, if any |  |
| Fujitsu | 3 |  |
| CATT | 3 |  |
| vivo | 3 | Agree with Huawei’s clarification. |
| ZTE | 1 or 2 | Option-3 works well for bi-directional Uu/PC5 RLC channel. However, for the unidirectional Uu/PC5 RLC channel, it is impossible to take the RB type of egress RLC channel as ingress RLC channel. For example, the remote UE1’s DRB1 is unidirectional (e.g. UL only). The Uu RLC channel 2 and PC5 RLC channel 3 for relaying remote UE1’s DRB1 may be also configured as unidirectional. In this case, the remote UE1’s DRB1 relevant bearer mapping entry may be configured at relay UE as follows:  Remote UE 1, DRB1 -> egress Uu RLC channel 2;  In this case, when relay UE receive the SRAP PDU from PC5 RLC channel 3, it can not determine the RB type of PC5 RLC channel 3 since there is no bearer mapping entry with PC5 RLC channel 3 as egress RLC channel. I guess in this case it needs to add one more condition, i.e. for PC5/Uu RLC channel with only unidirectional bearer mapping, it is regarded as DRB by default.  Actually, we prefer option-1 and option-2. The spec impact is very small and both solutions are more straightforward and simple for implementation compared with option-3. For option 1, it only need one bit indication in RRC signalling. For option-2, the only impact is to leverage one reserved bit. |

# Summary

# Reference

1. R2-2200007 Summary of [POST116-e][718][V2X SL] SL DRX configuration (Ericsson) Ericsson discussion
2. R2-2200045 Summary of [POST116-e][715][V2X/SL] RRC open issues Huawei, HiSilicon (Rapporteur) discussion
3. R2-2200051 Summary of [POST116-e][716][SL] MAC open issues LG Electronics Inc. (Rapporteur) discussion
4. R2-2200264 Discussion on remaining issues of SL DRX ZTE Corporation, Sanechips discussion Rel-17 NR\_SL\_enh-Core
5. R2-2200318 Leftover Issues for Sidelink Unicast DRX CATT discussion Rel-17 NR\_SL\_enh-Core
6. R2-2200319 Leftover issues for Sidelink GCBC DRX CATT discussion Rel-17 NR\_SL\_enh-Core
7. R2-2200344 Further discussions on leftover issues of sidelink DRX configuration NEC Corporation discussion
8. R2-2200345 Further discussions on sidelink MAC open issues NEC Corporation discussion
9. R2-2200373 Discussion on DRX left issues OPPO discussion Rel-17 NR\_SL\_enh-Core
10. R2-2200374 Discussion on DRX left issues from [716] [718] OPPO discussion Rel-17 NR\_SL\_enh-Core
11. R2-2200415 SL DRX CP aspects Lenovo, Motorola Mobility discussion NR\_SL\_enh-Core Revised
12. R2-2200483 Remaining issues for sidelink DRX Huawei, HiSilicon discussion Rel-17 NR\_SL\_enh-Core
13. R2-2200484 Remaining issues of SL communication impact on Uu DRX Huawei, HiSilicon discussion Rel-17 NR\_SL\_enh-Core
14. R2-2200528 Leftover aspects on SL DRX Intel Corporation discussion Rel-17 NR\_SL\_enh-Core
15. R2-2200530 On SL DRX and candidate resource selection Intel Corporation discussion Rel-17 NR\_SL\_enh-Core
16. R2-2200535 Discussion on remaining issues for SL DRX LG Electronics France discussion Rel-17 NR\_SL\_enh-Core
17. R2-2200536 Consideration on sidelink DRX for unicast LG Electronics France discussion Rel-17 NR\_SL\_enh-Core Withdrawn
18. R2-2200544 Consideration on sidelink DRX for unicast LG Electronics France discussion Rel-17
19. R2-2200545 Discussion on resource (re-)selection in SL DRX SHARP Corporation discussion NR\_SL\_enh-Core
20. R2-2200749 Discussion on remaining issues regarding Sidelink DRX ASUSTeK discussion Rel-17 NR\_SL\_enh-Core
21. R2-2200762 Remaining MAC issues for SL DRX Lenovo, Motorola Mobility discussion Rel-17
22. R2-2200786 NR Sidelink Synchronization Reference Search Optimization at UE for Power Saving Nokia, Nokia Shanghai Bell discussion NR\_SL\_enh-Core
23. R2-2200790 Discussion on Uu impact Xiaomi discussion
24. R2-2200791 Discussion on Sidelink DRX open issues Xiaomi discussion
25. R2-2200893 RRC remaining issues on SL DRX vivo discussion Rel-17
26. R2-2200894 MAC remaining issues on SL DRX vivo discussion Rel-17
27. R2-2200938 Remaining aspects of SL DRX Ericsson discussion Rel-17 NR\_SL\_enh-Core
28. R2-2201061 Discussion on remaining issues of SL DRX timers ZTE Corporation, Sanechips discussion Rel-17 NR\_SL\_enh-Core
29. R2-2201135 Discussion on remaining issues on SL-DRX Apple discussion Rel-17 NR\_SL\_enh-Core
30. R2-2201150 Resource Selection Considering DRX InterDigital discussion Rel-17 NR\_SL\_enh-Core
31. R2-2201151 Consideration of the Active Time for Periodic Transmissions InterDigital, Ericsson, ZTE, AsusTek, Huawei, HiSilicon, Lenovo, Motorola Mobility, Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SL\_enh-Core
32. Revised in R2-2201635
33. R2-2201635 Consideration of the Active Time for Periodic Transmissions InterDigital, Ericsson, ZTE, AsusTek, Huawei, HiSilicon, Lenovo, Motorola Mobility, Nokia, Nokia Shanghai Bell, Samsung discussion Rel-17 NR\_SL\_enh-Core
34. R2-2201152 Remaining Aspects on SL DRX InterDigital discussion Rel-17 NR\_SL\_enh-Core
35. R2-2201458 SL data transmission considering SL DRX active time Nokia, Nokia Shanghai Bell discussion NR\_SL\_enh-Core R2-2110747
36. R2-2201478 Resource selection considering SL DRX ITL discussion
37. R2-2201523 SL DRX CP aspects Lenovo, Motorola Mobility discussion NR\_SL\_enh-Core R2-2200415
38. R2-2201582 UE report on SL DRX for Uu DRX alignment Samsung Research America discussion
39. R2-2201585 Remaining details for GC/BC Samsung Research America discussion
40. R2-2201624 Discussion on Remaining Design Aspects for SL DRX Qualcomm Finland RFFE Oy discussion