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

**Online, January, 2022**

**Agenda item: 8.15.2**

**Source: OPPO**

**Title: Summary of [705]**

**Document for: Discussion and Decision**

# Introduction

This document is for the following discussion

* [POST116bis-e][705][V2X/SL] Open issues on SL DRX (OPPO)

 **Scope:** 1st phase: Make an open issue lists with the proposed candidate options or rapporteur suggestion. Open issue lists can include pre-identified issues (e.g. FFS, not decided or skipped from previous offline/email discussion) and new issues raised in company contributions at RAN2#116bis. For new issues that have not discussed before, rapporteur can collect companies’ inputs (e.g. whether it is essential issue that need to be considered and closed in Rel-17) and based on that, determine whether to be included in the open issue list or not. Note open issue lists also include UE capability issues raised in the company contributions.

2nd phase: email discussion on the identified open issues with collecting companies’ inputs on the candidate options or rapporteur’s suggestion.

 **Intended outcome:** Open issue list with the proposed candidate options or rapporteur’s suggestion from 1st phase (in R2-2201805). Discussion summary for the identified open issues from 2nd phase.

**Deadline:** 1st phase (1/21 – 1/28 UTC), 2nd phase (2/9 – 2/14 UTC)

# Discussion

Based on the Chairman guidance on categorization

* **Each open issue** should be associated with **suggested treatment/handling**.
	1. **Company input into Pre117-e-offline (i.e. no company tdocs)**
	2. Company tdocs invited.
	3. CR rapporteur handled issue
	4. Other, e.g. immature area, reference to dependency, unclear status etc.

The issues in this section is of category-1 (where some issues explicitly mention running-CR dependency can be handled as 3 jointly)

In each section, the issues are grouped as either old issues or new issues, and for new issues, companies can input on the need to discuss based on the following guidance. Furthermore, companies can also input if believe a specific old issue should be categorized into new issue (in order to doubt the necessity to discuss it), please be free to input as well

**For new issues that have not discussed before, rapporteur can collect companies’ inputs (e.g. whether it is essential issue that need to be considered and closed in Rel-17) and based on that, determine whether to be included in the open issue list or not.**

# Unicast-Specific Issues

# Common issues

Left issue on what DRX pattern to use for UC-based DCR message, to address the following FFS point

7: The default SL DRX configuration for BC/GC can be used for the DCR message. FFS for UC (at least for the initial message).

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200373 | OPPO | Proposal 1 Apply the same DRX scheme for UC-based DCR message as for BC-based DCR message, i.e., the default SL DRX configuration for BC/GC. |  |

**Q2.1.1-1 (old issue): Do you agree the default SL DRX configuration for BC/GC can be used for both BC-based and UC-based DCR message?**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| **Xiaomi** | **Yes with comments** | **We understand the UC-based DCR message is transmitted before AS unicast connection setup. Therefore, only DRX cycle and on-duration timer should be applied. Inactivity timer and retransmission timer is not applied for UC-based DCR message.** |
| ZTE | Agree | Agree with Xiaomi. We think default SL DRX configuration for BC not GC can be used. |
| Ericsson | agree |  |

Left issue on whether DRX is applicable to message between DCR message and *RRCReconfigurationSidleink* message, to address the following skipped proposal at R2#116

Proposal 25: RAN2 further discuss that whether SL DRX should be applied for the PC5-S messages which are sent after the DCR message and before SL unicast DRX configuration is applied.

* Skipped.

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 14: It is slightly preferred that the SL DRX is not applied to SL UC messages after DCR and before the SL DRX configuration is applied. |  |
| R2-2200373 | OPPO | Proposal 2 The PC5-S/PC5-RRC signalling after DCR and before UC DRX configuration is exchanged in a non-DRX manner. |  |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 12: RAN2 discuss the SL DRX configuration used during unicast establishment procedure, with following optionsl Option 1: preconfigured SL DRX configuration for [DCR~DCA], per-PQI SL DRX configuration after DCA and until dedicated SL DRX configuration is completedl Option 2: preconfigured SL DRX configuration after DCR and until dedicated SL DRX configuration is completedl Option 3: UE is always awake, i.e., no DRX, after the unicast link has been established and until dedicated SL DRX configuration is completed |  |
| R2-2200483 | HW | Proposal 14: RAN2 to adopt Option 2 to transfer other PC5-S message (SMC, DCA, etc.), PC5-RRC message related with UE capability interaction (i.e. UECapabilityEnquirySidelink message and UECapabilityInformationSidelink message), and the first RRCReconfigurationSidelink message (incl. DRX configuration):- Option 1: Using the same BC/GC DRX configuration for DCR message transmission to transmit these message. - Option 2: From RX UE perspective, DRX is deactivated after receiving DCR message and activated when receiving the first RRCReconfigurationSidelink message (incl. DRX configuration) |  |
| R2-2200528 | Intel Corporation | Proposal 2: It is proposed to not apply SL DRX for the PC5-S/PC5-RRC messages which are sent after the DCR message and before SL unicast DRX configuration is applied. |  |
| R2-2200544 | LG Electronics France | Proposal 2: The common default SL DRX configuration for BC/GC can be used until receiving RRCReconfigurationSidelink for the initial SL DRX configuration between TX UE and RX UE in unicast. For example, the messages for DCR, DCA, capability exchange, and initial SL DRX configuration can be transmitted on the default SL DRX configuration. |  |
| R2-2200938 | Ericsson | Proposal 21 Apply the common default SL DRX configuration for GC/BC also to the other initial signalling sent after the DCR message and before the SL unicast DRX configuration is applied. |  |
| R2-2201523 | Lenovo, Motorola Mobility | SL DRX Configuration during Unicast establishment procedure Proposal 5: RAN2 agree the SL DRX configuration used during unicast establishment procedure, with following option: Option 1: preconfigured SL DRX configuration for [DCR~DCA], per-PQI SL DRX configuration after DCA and until dedicated SL DRX configuration is complete |  |

**Q2.1.1-2 (old issue): Which option do you prefer for messages delivery between PC5-S DCR message and PC5-RRC *RRCReconfigurationSidelink* message including DRX configuration**

**Option-1: DRX is not applied**

**Option-2: DRX is applied, using default SL DRX configuration for BC/GC, i.e., the same as the one used for DCR message**

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| **Company** | **Option** | **Comment** |
| OPPO | 1 | 1 is helpful to reduce the CP latency, and is also the way adopted in Uu, i.e., no-DRX before DRX is configured. |
| Xiaomi | Option 1 | Unicast connection has been established, peer UEs are expected to apply the DRX configuration carried in *RRCReconfiguraitonSidelink* message. Applying default DRX would delay the *RRCReconfiguraitonSidelink* message reception and the power saving gain is marginal |
| ZTE  | 2 | If a default SL DRX configuration is used for messages delivery between PC5-S DCR message and PC5-RRC *RRCReconfigurationSidelink* message including DRX configuration, we shall consider the latency requirement and configure a proper SL DRX cycle to meet the latency requirement of PC5-S message. So it seems not a big issue. [OPPO] Is the part above something to work on further (how to configured this? only DRX cycle or other DRX parameters as well?) |
| Intel | Option 1 | Agree with Xiaomi and OPPO that we can avoid any additional latency until the SL DRX configuration is applied |
| **Ericsson** | **Option 2** |  |

Left issue on the content of assistance information of desired DRX configuration, to address the following skipped proposals in R2#116

Proposal 14: RAN2 to further discuss whether the drx-inactivity timer should be included in the RX UE’s desired SL DRX configuration.

Proposal 15: RAN2 to further discuss whether the HARQ RTT timer should be included in the RX UE’s desired SL DRX configuration.

Proposal 16: RAN2 to further discuss whether the HARQ retransmission timer should be included in the RX UE’s desired SL DRX configuration.

Proposal 19: RAN2 to further discuss when the Rx UE rejects the SL DRX configuration included in the RRCReconfigurationSidelink, which PC5-RRC signaling should be sent from Rx UE to Tx.

* Proposal 14, 15, 16 and 19 are skipped.

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 5: The inactivity timer, HARQ RTT timer and retransmission timer could be included in the desired SL DRX configuration to help gNB or Tx UE to determine the SL DRX configuration. |  |
| R2-2200344 | NEC Corporation | Proposal 1 From signaling design point of view, include drx-inactivity timer / HARQ RTT timer/ HARQ retransmission timer to the assistance information signaling. |  |
| R2-2200344 | NEC Corporation | Proposal 2 Whether to indicate RX UE’s desired drx-inactivity timer / HARQ RTT timer/ HARQ retransmission timer is up to RX UE’s implementation. |  |
| R2-2200373 | OPPO | Proposal 3 Inactivity timer/retransmission timer/RTT timer are not included in the RX UE’s desired SL DRX configuration. |  |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 6: Assistance information from Rx UE includes information with respect to a shift (drx-StartOffset) of the DRX Cycle with respect to the current start of the DRX cycle i.e., no other DRX configuration parameter from the Rx UE is provided. | For shift of the DRX cycle, this is the only paper proposing it, moderator suggest not to prioritize this issue. |
| R2-2200791 | Xiaomi | Proposal 9: RX UE provides undesired SL DRX configuration to TX UE in assistant information, i.e. its activated configured SL/UL grant resource allocation. |  |
| R2-2201152 | InterDigital | Proposal 4: Drx-inactivity timer, HARQ RTT timer, and HARQ retransmission timer are not included in the RX UE’s desired SL DRX configuration.  |  |
| R2-2200528 | Intel Corporation | Proposal 1: The drx-inactivity timer, SL HARQ RTT and HARQ retransmission timer shall not be included as part of the RX UE’s SL DRX desired configuration and how to configure them is up to the TX UE (or its serving gNB). |  |

**Q2.1.1-3a (old issue): Whether inactivity timer, HARQ RTT timer and re-transmission timer are included in assistance information from Rx UE to Tx UE? (companies can express preference for each timer respectively)**

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| **Company** | **Inactivity timer**  | **RTT timer**  | **Re-transmission timer** | **Comment** |
| OPPO | Not included | Not included | Not included | Since these timers do not lead to major difference to power consumption (compared to DRX cycle and on-duration timer), there seems more reasonable to leave the decision to Tx. |
| Xiaomi | No | No | No | **We understand these timers are more related to TX UE.** |
| ZTE | Yes | No | No | HARQ RTT timer and re-transmission timer is not needed since they totally depend on the capability and the resource selection situation of the TX UE. For inactivity timer, it may depend on the traffic pattern of the TX UE and the power saving requirement of the RX UE, so we think the inactivity timer can be included in the desired SL DRX configuration. However, whether the desired value of inactivity timer is adopted depends on TX UE side implementation. |
| Ericsson | no | no | no | The inactivity timer may be depending on traffic pattern, which can be determined by the TX UE itself, the other two timers are not affecting UE power consumption much. |

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200373 | OPPO | Proposal 4 For on-duration timer length and cycle value, value range (e.g., the minimum value and the maximum value for a parameter) can be used to express the desired SL DRX configuration. |  |
| R2-2200791 | Xiaomi | Proposal 8: Multiple sets of preferred SL DRX configuration could be included in assistance information, each set of SL DRX configuration corresponds to Uu DRX or SL DRX on other destinations. |  |
| R2-2200893 | vivo | Proposal 8 For the content of SL assistance information, agree one set of preferred SL DRX timers configuration included in UEAssistanceInformationSidelink. |  |

**Q2.1.1-3b (new issue): In assistance information from Rx UE to Tx UE, for each DRX setting (cycle, timer and etc.), do you think a single value is enough or multiple values are needed (detailed signalling format, whether multiple setting combination, or value range of each parameter, can be left to RRC running-CR discussion) (companies can express preference for each DRX setting respectively)**

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| **Company** | **Single-value / Multiple values** | **Comment** |
| OPPO | Multiple values | Single value can be seen as a unique case of multiple values, which can allow some flexibility / freedom for Tx decision. |
| Xiaomi | multiple setting combination  | UE may be configured with multiple DRX configurations on other SL connection or Uu connection. It may be impossible to merge these into one set of preferred DRX configuration, considering different DRX cycles or start offsets. Furthermore, the merging would make UE implementation more complicated. Therefore, UE should be allowed to provide multiple sets of preferred DRX configurations. |
| ZTE | Multiple values | If only one desired SL DRX configuration is included in the assistance information, and the TX UE cannot configure this desired SL DRX configuration, which other SL DRX configuration shall be taken as higher priority is not clear.  |
| Intel | Multiple values | It can be deemed more flexible, but we are also open to leave this to RRC running CR discussion if we cannot conclude here |
| **Ericsson** | **Multiple values** | **Providing multiple values can give TX UE more freedom to select the most suitable settings.** |

Left issue to consolidate the initiation condition for Rx-UE to send assistance information

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 4: Assistance information from a Rx UE for SL DRX configuration is triggered when 1) Tx UE capability indicate Tx UE support SL DRX; 2) DRX configuration received from Tx UE is not suitable. | **For 2), moderator understand as long as the previously sent assistance information has not changed, there is no need to re-send it.** |

In the current running-CR, it is described as

5.8.9.X.2 Initiation

For sidelink unicast, a UE capable of sidelink DRX may send this assistance information to its peer UE when the previously transmitted sidelink DRX assistance information has changed.

Moderator understands that on top of the existing initiation condition, further condition can be considered, e.g., 1) Tx capability indicate Tx-UE support SL DRX, 2) the assistance information has not been sent before.

**Q2.1.1-4 (new issue): On top of the existing RRC running-CR, any additional initiation condition needed for the delivery of assistance information?**

**Condition-1: peer-UE is capable of sidelink DRX**

**Condition-2: the assistance information has not been sent previously**

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| **Company** | **Condition(s)** | **Comment** |
| OPPO | 1 and 2 | The two seem straightforward. |
| Xiaomi | Condition 1 | Condition 1 is straightforward. For condition 2, we understand it’s up to UE’s implementation whether send the assistance information, i.e. even UEs are capable of SL DRX and assistance information has not been sent previously, UE could still choose not to send assistance information. Condition 2 seems to mandate UE to always send assistance information.[OPPO] Yet the logic seems hold for condition-1 as well?[Xiaomi] We understand the condition 1 is mandatory condition to allow assistance information transmission, i.e. UE can only send assistance information if peer UE is DRX capable. But condition 2 is not mandatory condition, i.e. regardless whether assistance information has been sent, UE always can send assistance information. Eventually, it’s up to UE implementation to decide whether send assistance information. |
| ZTE | 1  | Agree with xiaomi, according to previous agreement, the assistance information is not mandate that means the UE can choose not to send the assistance information even if the assistance information has not been sent previously. |
| Intel | Condition 1 | Same view as Xiaomi |
| **Ericsson** | **Neither condition 1 nor condition 2** | **It should be sufficient to leave up to UE implementation to determine when to send assistance information** |

Left issue to consolidate the Tx-UE behaviour to send DRX configuration

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 3: Assistance from Rx to Tx can be sent at any point. Tx does not have to wait for Rx assistance to decide and signal a DRX configuration to the Rx UE. | These two are different views. |
| R2-2200544 | LG Electronics France | Proposal 3: When initial SL DRX configuration, TX UE should wait for assistance information from RX UE for a certain period after capability exchange with RX UE.  |
| R2-2200264 | ZTE Corporation, Sanechips | Proposal 7 Considering that how to configure SL DRX is based on TX UE implementation, RAN2 shall design a mechanism to ensure that the TX UE will try its best to configure suitable SL DRX for the RX UE.  | These two are different viewsModerator understand assistance information has to be taken into account otherwise it goes against the motivation to introduce it.Seems the current RRC running CR did not put a restriction in the following section 5.8.9.X.3 Actions related to reception of UEAssistanceInformationSidelink messageFor sidelink unicast, when a UE is in RRC\_CONNECTED, it may report this assistance information received from its peer UE to the network. For sidelink unicast, when a UE in IDLE/INACTIVE or OOC has obtained this assistance information from its peer UE, it may derive the value of the inactivity timer based on its implementation. |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 5: If Rx assistance is available at the Tx UE, it can be considered by the Tx UE. |

**Q2.1.1-5a (new issue): After capability exchange, is there a need to define a time restriction for Tx-UE to send DRX related configuration to RX-UE?**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Disagree | It seems not a critical issue. As long as acceptable DRX configuration is provided upon reception of assistance information and/or reject information, it should be sufficient. |
| Xiaomi | No | We understand it’s up to UE’s implementation to whether provide the SL DRX configuration.Furthermore, if TX UE is using mode 1 RA, it’s up to gNB’s implementation to decide the SL DRX configuration. gNB has no accurate timing information of the SL capability exchange between peer UEs, so gNB is difficult to follow the time restriction. And we don’t put such restriction on gNB implementation. |
| ZTE | Disagree with comments | We think there is no need to define a time restriction for Tx-UE to send DRX related configuration to RX-UE if receiving no assistance information. But we shall discuss that is there a need to define a time restriction for Tx-UE to send DRX related configuration to RX-UE after it receive assistance information from RX UE. However,for this issue,we think whether need to define a time restriction depends on how to handle the case that no SL DRX configuration is received after sending assistance information. If the RX UE can accept that no SL DRX is configured after sending assistance information, the timer is not needed. Otherwise, the timer is needed. So we shall confirm how to handle the case of receiving no DRX configuration first, then discuss this question. |
| Intel | No | We agree with companies above that this seems very much like an unnecessary enhancement and can easily be handled by UE implementation |
| **Ericsson** | **agree** | **it is beneficial to introduce time restriction to limit the procedure.** |

**Q2.1.1-5b (new issue): Upon reception of *UEAssistanceInformationSidelink*, do you agree to capture Tx-UE behaviour on taking it into account for DRX configuration derivation (e.g., “it may derive the value of DRX settings based on its implementation by taking assistance information into account”, detailed wording can be left to MAC running-CR discussion)**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | No strong view but tend to agree, since the design assumes Tx-UE should follow the suggestion by Rx-UE, instead of allowing ignoring it. Otherwise, the procedure would not converge finally. |
| Xiaomi | Yes | We think this is aligned with the spirit of assistance information, i.e. TX side should take it into account. |
| ZTE | Agree | We do not know why to send and how to use the assistance information without this wording. |
| Intel | Agree | We thought this understanding was captured in chairman minutes. Nevertheless, we think that is the reasonable way forward. |
| **Ericsson** | **agree** | **We don’t have strong view either.** |

Left issue to consolidate Rx-UE behaviour to reject a DRX configuration, firstly, condition to reject DRX configuration

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200483 | HW | Proposal 2: RAN2 to discuss the following triggering conditions of SL DRX configuration failure/rejection in RX UE:- The received SL DRX does not match the desired SL DRX of the RX UE- The received SL DRX does not match the configured SL DRX(s) for other SL connection(s) of the RX UE- The received SL DRX does not match the SL DRX configuration(s) configured for its RX UE(s)- The received SL DRX does not match the power saving demand of the RX UE. | Moderator understand the first one seems straightforward, i.e., “The received SL DRX does not match the desired SL DRX of the RX UE” |

**Q2.1.1-6 (new issue): Is there a need to capture in spec the condition for Rx-UE to reject a DRX configuration?**

**Option-1: No**

**Option-2: Yes, condition of “the received SL DRX does not match the desired SL DRX of the RX UE sent in assistance information”**

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| **Company** | **Option** | **Comment** |
| OPPO | 1 or 2 | No strong view but if capture, “desired configuration” should be the only condition (no more than that), i.e., the design should not allow arbitrary rejection by Rx-UE. Otherwise, there is no deterministic criterion for Tx-UE implementation to derive a feasible DRX configuration. |
| Xiaomi | Option 1 | We may not be able to list all possible cases in spec. Anyway RX UE’s implementation should be allowed to reject the DRX configuration. |
| ZTE | 1 | We can consider to leave a modification space of SL DRX configuration to TX UE. In addition, if it is specified that RX UE will always reject a DRX configuration that does not match the desired SL DRX of the RX UE sent in assistance information, we cannot image why does TX UE send such kind of SL DRX configuration. If TX UE will not send SL DRX configuration that does not match the desired SL DRX of the RX UE, then the agreed SL DRX acceptance or rejection message become unnecessary. |
| Intel | Option 1 | We agree that it may be tricky capturing additional conditions in the specification for when RX UE can reject the DRX configuration. Besides, it should be aligned with the TX UE behavior of what SL DRX configuration to send being up to implementation. |
| **Ericsson** | **Option 1** | **We share the concerns raised by xiaomi and ZTE. It is TX UE that determines what DRX configuration should be used by RX UE. It is sufficient to leave to RX UE implementation which may reject SL DRX. Adding any condition may cause misalignment to the principles of TX centric approach. In addition, RX UE can indicate the rejection cause in the response message to TX UE, this is sufficient for TX UE to understand the reason why RX UE rejects the DRX configurtation.** |

Secondly, what message to use to reject a DRX configuration

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 3: RRCReconfigurationFailureSidelink is used by Rx UE to reject the Tx UE’s SL DRX configuration. |  |
| R2-2200318 | CATT | Proposal 4: If SL DRX configuration is rejected by Rx UE, the Rx UE can send RRCReconfigurationFailureSidelink message to Tx UE, and it is unnecessary to introduce additional cause value in the RRCReconfigurationFailureSidelink message. |  |
| R2-2200344 | NEC Corporation | Proposal 4 When the Rx UE rejects the SL DRX configuration included in the RRCReconfigurationSidelink, RRCReconfigurationCompleteSidelink with a new DRX rejection indication should be sent from Rx UE to Tx UE. |  |
| R2-2200373 | OPPO | Proposal 5 Use RRCReconfigurationCompleteSidelink message to indicate the SL DRX rejection from Rx UE. |  |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 8: Reuse RRCReconfigurationFailureSidelink to indicate SL DRX configuration failure |  |
| R2-2200415 | Lenovo, Motorola Mobility | Proposal 9: A failure cause is added in RRCReconfigurationFailureSidelink to differentiate whether the radio configuration is failed or SL DRX configuration is failed. Similar information  |  |
| R2-2200791 | Xiaomi | Proposal 2: If there is configuration error for the sidelink configuration carried in RRCReconfigurationSidelink, UE response with RRCReconfigurationFailureSidelink, otherwise, UE response with RRCReconfigurationCompleteSidelink. |  |
| R2-2200791 | Xiaomi | Proposal 3: Introduce new indication for RX UE to inform TX UE the sidelink DRX configuration accept or reject on sidelink. |  |
| R2-2200791 | Xiaomi | Proposal 4: Indication of DRX configuration accept or reject is carried in RRCReconfigurationCompleteSidelink. |  |
| R2-2200791 | Xiaomi | Proposal 5: TX UE checks the indication of DRX configuration accept or reject in RRCReconfigurationCompleteSidelink to determine whether the sidelink DRX configuration carried in corresponding RRCRecofigurationSidelink is applied or not by RX UE |  |
| R2-2200791 | Xiaomi | Proposal 6: TX UE considers the Sidelink configuration other than DRX carried in corresponding RRCRecofigurationSidelink applied by RX UE upon reception of RRCReconfigurationCompleteSidelink. |  |
| R2-2200938 | Ericsson | Proposal 3 RX UE replies RRCReconfigurationFailureSidelink if the SL DRX configuration is rejected, with a new rejection cause included. |  |
| R2-2200938 | Ericsson | Proposal 4 In case the RX UE has rejected the SL DRX configuration, the RX UE shall reject the whole RRC reconfiguration as in Uu. |  |
| R2-2201523 | Lenovo, Motorola Mobility | SL DRX configuration rejectionProposal 1: Reuse RRCReconfigurationFailureSidelink to indicate SL DRX configuration failure |  |
| R2-2201523 | Lenovo, Motorola Mobility | Proposal 2: A failure cause is added in RRCReconfigurationFailureSidelink to differentiate whether the radio configuration has failed, or SL DRX configuration has failed. |  |
| R2-2200544 | LG Electronics France | Proposal 4: RX UE can continue to use the prior SL DRX configuration until receiving a new SL DRX configuration after transmitting assistance information/rejection message. | Moderator understand it would be business as usual if *RRCReconfigurationFailureSidelink* is used, and can clarify in case *RRCReconfigurationCompleteSidelink* is used |

**Q2.1.1-7(old issue): In order for Rx-UE to reject a DRX configuration, which message to use,**

**Option-1) *RRCReconfigurationFailureSidelink* or**

**Option-2) *RRCReconfigurationCompleteSidelink*?**

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| **Company** | **Option** | **Comment** |
| OPPO | 2 | Although no strong view, we believe it is not reasonable to adopt *RRCReconfigurationFailureSidelink* but allows the Rx-UE behaviour that only reject the DRX configuration within *RRCReconfigurationSidelink*, i.e., accept the non-DRX configuration – which is more proper to be handled by *RRCReconfigurationCompleteSidelink*. |
| Xiaomi | 2 | RRCReconfigurationFailureSidelink is used to indicate reconfiguration failure, while DRX reject is not reconfiguration failure. |
| ZTE | 2 | After PC5 link has been established, the first RRCReconfigurationSidelink may include all the SL DRB, SL measurement and SL DRX configuration information, if only the SL DRX cannot be accepted, sending the RRCReconfigurationFailureSidelink may make the TX UE not know whether SL DRB or SL measurement configuration is unable to complied by the RX UE. |
| Intel | No strong view | Using the RRCReconfigurationFailureSidelink seems more appropriate, but we are fine to go with the majority on this |
| **Ericsson** | **1** | **It is reasonable to use the same failure message as in the legacy. DRX rejection is just an additional failure cause.** |

**Q2.1.1-7a (old issue): In case *RRCReconfigurationFailureSidelink* is adopted, do you agree to introduce an indication for the DRX configuration rejection *RRCReconfigurationFailureSidelink*?**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Disagree | See our reply to Q2.1.1-7, i.e., if failure message is adopted, the behaviour should be all configuration rejected including both DRX and non-DRX configuration. |
| Ericsson | agree | Without rejection cause, TX UE will not be able to understand the reason why RX UE has rejected the DRX configuration[OPPO] Then should Rx-UE reject all configuration or only the DRX-related configuration in such case? |

**Q2.1.1-7b (old issue): In case *RRCReconfigurationCompleteSidelink* is adopted, do you agree to introduce an indication for the DRX configuration rejection *RRCReconfigurationCompleteSidelink*?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Otherwise, there is no way to differentiate between 1) all configuration accepted and 2) only non-DRX configuration accepted. |
| Xiaomi | Yes |  |
| ZTE | Yes |  |
|  |  |  |

**Q2.1.1-8 (new issue): In case *RRCReconfigurationCompleteSidelink* is adopted, after rejecting the DRX configuration, should the Rx-UE use the prior SL DRX configuration until receiving a new SL DRX configuration?**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Seems straightforward. |
| Xiaomi | Yes |  |
| ZTE | See comments | If there is active SL DRX configuration before rejecting the DRX configuration, we agree that the RX UE use the prior SL DRX configuration. But if we agree that no DRX is used for PC5-S message as discussed in Q2.1.1-2, then we shall discuss which DRX configuration shall be used after rejecting the DRX configuration if no SL DRX configuration is used at that time. |
| Intel | Agree |  |

Given the tool to reject the undesired DRX-configuration by Rx-UE, left issue on the necessity of additional tool to avoid Tx-UE implementation keeping sending the undesired DRX configuration

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200264 | ZTE Corporation, Sanechips | Proposal 8 If RX UE sends SL DRX assistance information, but the TX UE does not configure acceptable SL DRX for the RX UE and no SL DRX is used before, the RX UE can use desired SL DRX configuration included in the assistance information, or use default SL DRX instead of using no SL DRX. | I.e., if the DRX configuration is not desired, RX UE would start using desired configuration by itself. Moderator understand the feasibility of this scheme relates to whether all DRX parameters are included in assistance information or not. |
| R2-2200544 | LG Electronics France | Proposal 5: If RX UE receives SL DRX configuration unable to comply despite transmitting assistance information or rejection messages, the RX UE should be allowed unicast session release. | I.e., if the DRX configuration is not desired, RX UE may disconnect. |
| R2-2200544 | LG Electronics France | Proposal 6: If RX UE does not receive any new SL DRX configuration from TX UE despite transmitting assistance information or rejection messages, the RX UE should be allowed unicast session release. |
| R2-2200544 | LG Electronics France | Proposal 7: RX UE needs a timer after transmitting assistance information or rejection message to TX UE. The timer is used to determine whether RX UE finally complies with the SL DRX configuration. | I.e., the timer used as a “deadline” for Tx-UE to send desired DRX configuration |
| R2-2200893 | vivo | Proposal 4 The SL DRX negotiation procedure between SL TX UE and SL RX UE can be either one-shot or multiple-shot. |  |
| R2-2200893 | vivo | Proposal 5 When SL TX UE is RRC IDLE/IANCTIVE/OOC, it’s up to SL TX UE to select one shot or multiple shots for the SL DRX negotiation procedure between SL TX UE and SL RX UE. |  |
| R2-2200893 | vivo | Proposal 5 When SL TX UE is RRC IDLE/IANCTIVE/OOC, it’s up to SL TX UE to select one shot or multiple shots for the SL DRX negotiation procedure between SL TX UE and SL RX UE. |  |
| R2-2200893 | vivo | Proposal 6 When SL TX UE is RRC IDLE/IANCTIVE/OOC, if multiple-shot SL DRX negotiation is executed, RAN2 to discuss some mechanism (e.g., timer or counter) to avoid endless negotiation between SL TX UE and SL RX UE. | I.e., the timer + counter for Tx-UE to send desired DRX configuration.Moderator suggest to focus on the timer since the counter proposal is from a single paper, and anyway counter cannot work alone without timer. |
| R2-2200893 | vivo | Proposal 7 When SL TX UE is RRC CONNECTED, it’s up to SL TX UE’s serving gNB to select one shot or multiple shots for the SL DRX negotiation procedure between SL TX UE and SL RX UE. No specification impact is foreseen. |  |

**Q2.1.1-9a (new issue): Is there a need to introduce a restriction for Tx-UE to send desired DRX configuration to Rx-UE after Rx-UE reject the DRX configuration**

**Option-1: No**

**Option-2 (new issue): Yes, a timer is needed (e.g., the timer starts upon Rx-UE reject the DRX)**

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| **Company** | **Option** | **Comment** |
| OPPO | 2 | There seems a point to design such scheme, since otherwise there is a bug that Tx-UE may implement in a way that it keeps providing unacceptable DRX configuration to Rx-UE. |
| Xiaomi | Option 1 | We understand it’s up to UE’s implementation to whether provide the SL DRX configuration.Furthermore, if TX UE is using mode 1 RA, it’s up to gNB’s implementation to decide the SL DRX configuration. gNB has no accurate timing information of the reject message reception, so is difficult to follow the timer restriction. And we don’t put such restriction on gNB implementation. |
| ZTE | 1 | As we disussed in Q2.1.1-8 (new issue): after rejecting the DRX configuration, the Rx-UE use the prior SL DRX configuration until receiving a new SL DRX configuration. So it seems not necessary to introduce a time restriction for Tx-UE. |
| Intel | Option 1 with comment | We are not sure if there is some restriction on the TX UE to send the DRX configuration within a certain time for the first time? If there isn’t, then we don’t think it should be introduced in this case when the RX UE has rejected the previously send DRX configuration either. |
| **Ericsson** | **2** | **It is beneficial to introduce a timer to limit the process. Otherwise, the process will just continue without ending.** |

**Q2.1.1-9b (new issue): If option-2 (or any similar timer-based solution) is selected in the question above, what should be the result upon the expiry of this timer?**

**Option-1: Rx-UE starts using desired DRX configuration autonomously;**

**Option-2: Rx UE release the unicast link with Tx UE (e.g., using PC5-S message PROSE DIRECT LINK RELEASE REQUEST)**

**Option 3: RX UE uses the default DRX configuration,**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | 2 | If the abnormal case happens, it means the QoS requirement (which decides the DRX configuration provided by Tx) does not match with the power saving requirement (which decides the desired DRX configuration suggested by Rx), so there is no point to continue the communication. |
| Ericsson | 3 | Better to use the default DRX configuration in this case. |

# Issues related to network involvement

Left issue on gNB capability w.r.t SL-DRX

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200544 | LG Electronics France | Proposal 15: If gNB does not have DRX capability, TX UE keeps the controllability of configuring SL DRX configuration for RX UE. |  |
| R2-2200790 | Xiaomi | Proposal 6: UE triggers **SUI to report SL DRX information**, i.e. received assistance information and SL DRX, if SL DRX configuration in SIB is present and UE did not report SL DRX information. |  |
| R2-2200893 | vivo | Proposal 1 The UE shall only report SUI carrying the SL DRX configuration or SL assistance information to its serving gNB if its serving gNB is SL-DRX capable. |  |
| R2-2200893 | vivo | Proposal 2 Introduce 1-bit indication in SIB12 to indicate gNB’ support of SL DRX. | Moderator understand there is at least other ways to implicitly indicate it, e.g., by the existence of SL-DRX configuration for GC/BC in SIB12, or rely on configuration in dedicated RRC signalling for RRC\_CONNECTED UE to control the report of DRX related information using SUI. |

**Q2.1.2-1a (new issue): Do you agree that it is possible that gNB, which provides SL configuration to in-coverage UE, may or may not support SL-DRX?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | See comment | Seems reasonable if considering the difference between R16 and R17 SL-capable gNB.Yet we leave it to network vendor to have a say. |
| Xiaomi | Yes | SL and SL DRX are separate features introduced in different releases. |
| ZTE | Yes |  |
| Intel | Yes |  |
| **Ericsson** | **Yes** |  |

**Q2.1.2-1b (new issue): If yes to 1a above, how for gNB to notify its capability of SL-DRX support to UE?**

**Option-1: using indication in SIB12 explicitly**

**Option-2: using indication in SIB12 implicitly**

**Option-3: using indication in dedicated RRC signaling**

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| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 or 3 | For option-1/2: If put the flag into SIB, we do not see the need of option-1, since the presence of DRX configuration for GC/BC can already reflect that (we do not see a scenario where GC/BC configuration is not provided in SIB12, yet the gNB is capable for SL DRX)Or if put the flag into dedicated RRC (option-3), it is also fine. |
| Xiaomi | Option 2 | SL DRX configuration for BC/GC is only included in SIB. So, if a cell supports SL DRX, SIB shall include at least SL DRX configuration for BC/GC. Therefore, the presence of SL DRX configuration in SIB could implicitly indicate the capability of serving cell.Both IDLE and CONNECTED UE should accquire the SIB for BC and GC SL DRX configuration. Therefore, dedicated RRC signalling is not needed. |
| ZTE | 2 | Agree with Xiaomi. |
| Intel | Option 2 | The presence of this configuration in SIB12 should implicitly imply support of SL-DRX. We are also fine with option 3 |
| **Ericsson** | **2** | **Agree with xiaomi** |

Left issue on what additional report to gNB is needed besides the following agreed one(s)

Agreements on TX-UE centric or RX-UE centric DRX configuration determination

1: In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other UE as Rx-UE, support signalling exchange including both 1) Signaling-1: signalling from RX-UE to TX-UE, and 2) Signaling-2: signalling from TX-UE to RX-UE.

[…]

3: In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other UE as Rx-UE, when Tx-UE is in-coverage and in RRC\_CONNECTED state, Tx-UE may report the information received in signaling-1 (Rx->Tx) to the serving network.

[…]

5: In SL unicast, for DRX configuration of each direction where one UE as Tx-UE and the other as Rx-UE, when Rx-UE is in-coverage and in RRC\_CONNECTED state, Rx-UE report the DRX configuration received in signalling-2 (Tx->Rx) to the serving network.

|  |  |  |  |
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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200791 | Xiaomi | Proposal 7: CONNECTED TX UE indicate RX UE’s reject or reception of sidelink DRX to gNB. | Report for reject, based on 116b agreement, moderator understand it is for mode-1 case only. |
| R2-2200938 | Ericsson | Proposal 5 A RRC\_CONNECTED Tx UE informs its serving gNB of the rejection of SL DRX configuration. |
| R2-2200544 | LG Electronics France | Proposal 11: When TX UE in RRC\_IDLE/INACTIVE or OoC, performing SL DRX, becomes RRC\_CONNECTED, if the serving gNB of TX UE configures to provide, TX UE reports SL DRX configuration for RX UE and stored assistant information from RX UE. | Report by Tx-UE on DRX configuration, based on 116b agreement, moderator understand it is for mode-2 case onlyReport by Tx-UE on assistance information, based on 116b agreement, moderator understand it is for mode-1 case only |
| R2-2200544 | LG Electronics France | Proposal 14: RX UE reports the latest SL DRX configuration received from TX UE to its serving gNB if the serving gNB configures to provide but not provided yet. | Report by Rx-UE on DRX configuration |
| R2-2201135 | Apple | Proposal 10 If mode 2 TX UE self-determines the SL DRX configuration for unicast link, Mode-2 TX UE in RRC\_CONNECTED may inform its serving gNB about its decided SL-DRX configuration by including it in UE Assistance information. | Report by Tx-UE on DRX configuration, moderator understand it is reported only for the DRX configuration accepted by Rx-UE |
| R2-2200544 | LG Electronics France | Proposal 15: If gNB does not have DRX capability, TX UE keeps the controllability of configuring SL DRX configuration for RX UE. | i.e., even in mode-1, it behave as for mode-2 for DRX setting |

**Q2.1.2-2a (new issue): At least for gNB which is capable of SL-DRX, do you agree that Tx-UE report assistance information only in case of mode-1?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Since for mode-2, it is the Tx-UE itself to decide on DRX configuration. |
| Xiaomi | Yes | Since it’s gNB which decides the SL DRX configuration. |
| ZTE | Yes | Agree with OPPO and Xiaomi. |
| Intel | Yes | We assume assistance information here is related to request of SL DRX configuration |
| **Ericsson** | **agree** |  |

**Q2.1.2-2b (new issue): At least for gNB which is capable of SL-DRX, do you agree that Tx-UE report DRX configuration reject information only in case of mode-1?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Disagree | We agree this report is not needed for mode-2 since or mode-2, it is the Tx-UE itself to decide on DRX configuration.We do not see the need for this report for mode-1 either, since we do not see it as a typical case, that gNB, after receiving the assistance information, still insist to provide an unacceptable DRX configuration. It may happen at UE implementation but should not be the case for gNB. Otherwise, the resulted signalling to solve the rejection case would be too much: 2 signalling at PC5 and Uu to reject and 2 signalling for Uu and PC5 to send updated DRX configuration, for each rejection.. |
| Xiaomi | Yes | Since it’s gNB which decides the SL DRX configuration. Without this information, gNB has to know whether SL DRX is accepted or rejected by peer UE, so to schedule the transmission resource appropriately. |
| ZTE | Agree | We understand the rejected SL DRX configuration will be not used by the RX UE, so it is necessary to let the gNB of TX UE know whether the updated SL DRX configuration is accepted or not. If accepted, the gNB shall schedule sidelink resource based on the new SL DRX configuration. If rejected, the gNB may need to schedule sidelink resource based on previous SL DRX configuration. In addition, the gNB can consider to change SL DRX configuration and send to the TX UE again. |
| Intel | Agree | We assume the question only relates to mode 1 since mode 2 is not relevant here anyway. For mode 1, since gNB provides the SL DRX configuration, we need to have some way to let the gNB know about the reject. We see OPPO’s point that it would lead to increased signaling overhead, but to us it seems inevitable if the goal is informing the gNB about the reject by the RX UE. |
| **Ericsson** | **Agree.** | **It doesn’t make sense that TX UE doesn’t report the received rejection indication in case the gNB controls the DRX configuration.** |

**Q2.1.2-2c (new issue): At least for gNB which is capable of SL-DRX, do you agree that Tx-UE report DRX configuration accepted by Rx-UE only in case of mode-2?**

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| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | [OPPO] revise the point, it is for gNB of Tx-UE to configure Tx resource pool in a proper way to align with the SL DRX. |
| Xiaomi | No | Since TX UE selects transmission resource in mode 2, TX UE’s gNB does’t need to know the SL DRX configuration of RX UE. |
| ZTE | Disagree | We do not see the necessity of reporting DRX configuration accepted by Rx-UE if TX UE is in mode-2 since the gNB will not allocate sidelink resouce. |
| Intel | Disagree | We think reporting this for mode 2 UE may not be essential |
| **Ericsson** | **disagree** | **To OPPO, in case of Mode 2 scheduling, TX UE doesn’t need to align its Uu DRX and SL DRX of RX UE. But, it may be beneficial RX UE to report its SL DRX to its gNB even if it is Mode 2 scheduling, so gNB of RX UE can align Uu DRX of RX UE and SL DRX of RX UE.** |

**Q2.1.2-2d (new issue): If yes to Q2.1.2-1a above, do you agree to rely on the gNB capability notification, as output of Q2.1.2-1b above, to disable Tx/Rx-UE report (including all DRX related report by Tx-UE, i.e., assistance information, DRX reject information, DRX configuration information, and report by Rx-UE, i.e., DRX configuration information for UC and QoS information for GC/BC), if gNB is not capable of SL-DRX?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Since all of these reports can be saved for a SL DRX incapable gNB. |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| **Ericsson** | **agree** |  |

**Q2.1.2-2e (new issue): If yes to Q2.1.2-1a above, do you agree to rely on the gNB capability notification, as output of Q2.1.2-1b above, always rely on Tx-UE itself (as for mode-2) to determines SL DRX for RX UE, if gNB is not capable of SL-DRX?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | There seems no other way around. |
| Xiaomi | Disagree | There may be confusion about the question. Maybe rapp can further clarify the referred scenario. Does it refer to the case that gNB doesn’t support SL DRX?[OPPO] Sorry for the confusing Q, revised. The intention is to ask whether e.g., even the UE is in mode-1, if gNB is not DRX-capable, it can only rely on Tx-UE to decide on DRX configuration.With revised Q, in mode 1, gNB is in charge of transmission resource scheduling. If the SL DRX is decided by Tx UE, it’s unavoidable that gNB schedule the transmission resource fall into inactive time, which would result in lots of resource waste. Therefore, in this case, SL DRX should not be applicable. |
| ZTE |  | Same view with Xiaomi. |
| **Ericsson** |  | Same view as xiaomi |

Left issue on signalling content

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2201582 | Samsung Research America |  [Proposal 2]: For UC, list of source UE id (as TX UE id), the destination UE id (as RX UE id), SL DRX cycle length, SL DRX start offset and SL DRX on-duration timer are included in the report.  |  |
| R2-2201582 | Samsung Research America | [Proposal 3]: For UC, SL DRX inactivity timer, SL DRX HARQ RTT, and SL DRX HARQ retransmission timer are not needed in the report. | Moderator see the point that for Rx-UE it is not feasible for gNB to know the status of inactivity / RTT / Retx timer, while it may be possible for gNB of Tx-UE (mode-2) |

**Q2.1.2-3a (new issue): For DRX configuration report by Rx-UE, which DRX parameter(s) should be included?**

**Parameter-1: SL DRX cycle length**

**Parameter-2: SL DRX start offset**

**Parameter-3: SL DRX on-duration timer length**

**Parameter-4: SL DRX inactivity timer length**

**Parameter-5: SL DRX HARQ RTT timer length**

**Parameter-6: SL DRX HARQ retransmission timer length**

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| **Company** | **Parameter** | **Comment** |
| OPPO | 1,2,3 | Tend to agree with the point in 1582, i.e., parameter-4/5/6 cannot help gNB since gNB cannot know the initial/re-transmission reception status at Rx-UE side anyway. |
| Xiaomi | At least parameter 1, 2 and 3 | Parameter 1-3 is necessary for gNB to provide aligned Uu DRX configuration. For other parameters, we are open. |
| ZTE | 1,2,3 | At least parameter 1,2 and 3 is useful for gNB. For other parameters, we can follow the majority view. |
| Intel | At least parameters 1, 2, 3 |  |
| **Ericsson** | **1,2,3** | **We are also open to further discuss 4,5,6** |

**Q2.1.2-3b (new issue): If one answer Yes to Q2.1.2-2c, for DRX configuration report by Tx-UE, which DRX parameter(s) should be included?**

**Parameter-1: SL DRX cycle length**

**Parameter-2: SL DRX start offset**

**Parameter-3: SL DRX on-duration timer length**

**Parameter-4: SL DRX inactivity timer length**

**Parameter-5: SL DRX HARQ RTT timer length**

**Parameter-6: SL DRX HARQ retransmission timer length**

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| --- | --- | --- |
| **Company** | **Parameter** | **Comment** |
| OPPO | 1,2,3,4,5,6 | Different from Rx-UE, gNB of Tx-UE can be aware of the initial/re-transmission status at Tx-UE side. |
| Xiaomi | None | Since we think TX-UE using mode 2 doesn’t need to report RX UE’s SL DRX configuration to gNB. |
| ZTE | None |  |
| **Ericsson** | **None** | **As xiaomi mentioned, there is no need to report SL DRX in case of Mode 2** |

Left issue on the usage of DRX command MAC CE for mode-1 UE

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200373 | OPPO | Proposal 13 RAN2 to discuss the following options on SL DRX command MAC CE in mode-1: 1) gNB takes in charge of sending SL DRX command MAC CE; 2) Tx UE determines on sending SL DRX command MAC CE by itself and reports this to gNB, and 3) do not use SL DRX command MAC CE in mode-1. | The reason is to check how for NW and UE to sync on DRX active time considering the usage of DRX command MAC CE by Tx-UE. |

**Q2.1.2-4 (new issue): For Tx-UE in mode-1, whether SL DRX command MAC CE can be used?**

**Option-1: No**

**Option-2: Yes, and Tx-UE can only use it based on network indication (for which new signalling is needed)**

**Option-3: Yes, and Tx-UE has to notify network on the usage (for which new signalling is needed)**

**Option 4: Yes, and Tx UE determines on sending SL DRX command MAC CE by itself and no need to report this to gNB**

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| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 | SL DRX command which is adopted by Tx-UE cannot be predicted by gNB, so we do not see how option-4 can work.Within option-1/2/3, to save further specification work, we can adopt option-1, yet we are open to option-2/3. |
| Xiaomi | Option 4 | It’s up to TX UE’s implementation. If UE can ensure there is no SL data arrival in remaining active time, it can send SL DRX command MAC CE. |
| ZTE | Option 4 | Although the SL DRX is configured by the serving cell and the sidelink resource is allocated by the serving cell, but whether allocating Sidelink resource depends on SL SR/BSR from the TX UE. In another word, only the TX UE can predict whether there is SL data arrival in remaining active time or not. [OPPO] A Q to all who selected option-4, then how for network to know the DRX command MAC-CE is used, and thus should refrain from providing SL grant in mode-1? Note that BSR does not provide information on DRX status at all, i.e., gNB cannot know the usage of DRX command MAC-CE based on BSR.[Xiaomi] Our understanding is UE should ensure there is no SL data arrival in remaining SL active time, which means no SL BSR would be triggered. If UE can’t ensure no SL data arrival, UE should not send SL DRX command MAC CE.So it is reasonable for the Tx UE determines on sending SL DRX command MAC CE by itself. Moreover, this solution is also aligned with the case of mode 2. |
| Intel | Option 4 | In order to align with the behaviour in mode 2 and avoid additional specification work, option 4 makes the most sense |
| **Ericsson** | **Option 2** | **For Mode 1, the final decision on whether SL DRX command should be triggered shall be controlled by the gNB. For the new signaling, it is sufficient to let gNB to also send SL DRX command MAC CE. In this case, TX UE can just forward the received SL DRX command MAC CE to RX UE.** |

# Groupcast/Broadcast-Specific Issues

Left issue on LCP impact due to Tx profile

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| **Tdoc** | **Company** | **Proposals and Moderator’s remark** | **Moderator’s recommendation** |
| R2-2200264 | ZTE Corporation, Sanechips | Proposal 1 It is suggested to send a LS to SA2 to request them consider the TX profile issue when UE selects the default Destination Layer-2 IDs for the initial signalling. | Moderator understand the root issue is due to a single L2 ID map to different service type with different Tx profiles |
| R2-2200938 | Ericsson | Proposal 34 Define rules for UE to determine which profile shall be applied in case UE has data with different profiles (e.g., belonging to different services types, etc.) for transmission, e.g., select the profile according to the service with the highest priority. | Moderator understand the root issue is due to a single L2 ID map to different service type with different Tx profiles |

Given the following agreement from 116b, moderator understand it is a special case of “a single L2 ID mapped to multiple DRX pattern”, i.e., One associated DRX pattern is non-DRX, and the straightforward solution is to ignore such associated Tx profile since that does not affect the DRX pattern selection.

10: Working assumption (down-selection for DRX cycle and on-duration for GC/BC when multiple QoS profiles are associated with the same DST L2 id) is confirmed as an agreement.

11: TX/RX UE determines the DRX cycle applied for groupcast/broadcast transmissions associated with a specific L2 destination ID as the minimum DRX cycle configured for any of the QoS profiles associated with that L2 destination ID.

**Q2.2-1a (new issue): Do you agree a same L2 ID may associate with multiple Tx profile, and thus may associate with both DRX-based Tx profile and non-DRX based Tx profile?**

**Option-1: Yes**

**Option-2: No**

**Option-3: Ask SA2**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 or 3 | Confirmed by our S2 colleague.If the issue becomes controversial, we can ask SA2 |
| Xiaomi | 1 |  |
| ZTE | 3 | According to TS23.287, the following sets of information for V2X communications over PC5 reference point is provisioned to the UE:- the mapping of V2X service types to PC5 RAT(s) (e.g. LTE PC5, NR PC5 or both), and:- for LTE PC5, to the corresponding Tx Profiles (see TS 36.300 [9] for further information);- for NR PC5, to the corresponding NR Tx Profiles for broadcast and groupcast (see TS 38.300 [11] and TS 38.331 [15] for further information).That means the NR Tx Profiles is configured per for V2X service types for broadcast and groupcast .However,During the Procedure for Broadcast mode of V2X communication over PC5 reference point, it is described that:The destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of receiving UE(s) for the reception.The source Layer-2 ID, the destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of transmitting UE for the transmission.During the Procedure for groupcast mode of V2X communication over PC5 reference point, it is described that :The source Layer-2 ID, destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of transmitting UE for the groupcast mode communication transmission. The destination Layer-2 ID, the NR Tx Profile and the PC5 QoS parameters are passed down to the AS layer of receiving UE(s) for the groupcast mode communication reception.So we think it is clear that a same L2 ID is associate with one Tx profile for groupcast and broadcast. [OPPO] Even for GC/BC, the usage of default L2 ID may lead to the 1-to-many mapping here.But for unicast, we have agreed the default SL DRX configuration for BC/GC can be used for the DCR message. So we shall know the TX profile for the DCR, too. However, according to the TS 23.287, there is no description on how to identify the TX profile for the initial signalling. So we suggested to send a LS to SA2 to ask them how to get the TX profile for the DCR for unicast. |
| Intel |  | We are fine to check with SA2  |
| **Ericsson** | **1** | In NR SL, packets belonging to different services may still be associated with the same L2 destination ID. Consequently, a UE may have to decide whether/how to multiplex packets with different service types.This is already clear, no need to bother SA2. |

**Q2.2-1b (new issue): If yes to 1a, for the case of a same L2 ID associating with both DRX-based Tx profile and non-DRX based Tx profile, do you agree the DRX setting are decided based on the DRX-based Tx profile only.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Since otherwise (i.e., no DRX is used), it would cause problem to the service-types / Tx-profiles requiring DRX. |
| Xiaomi | No | We think the DRX applicability is determined per destination. If a L2 ID is associated with at least one non-DRX based Tx profile, DRX is not applied for this destination. UE doesn’t need to decide DRX setting for this L2 ID. |
| ZTE | Disagree  | We shall ask SA2 first. |
|  |  |  |
| **Ericsson** | **Disagree.** | According to RAN2#115e agreements, for GC/BC, a Rel-17 TX UE shall only assume SL DRX for the RX UEs when the associated TX profile corresponds to support of SL DRX, while a Rel-17 RX UE determines SL DRX is used if all service types/L2 IDs of interest have an associated TX profile corresponding to support of SL DRX. **In this case, SL DRX shall not be applied if there is one TX profile doesn’t support SL DRX.**[OPPO] there seems different reason of the 1-to-many mapping here, e.g., we were considering the usage of default L2 ID, where different Rx UE may be interested at different service behind the same default L2 ID, some requiring DRX while some do not. In this case, the usage of DRX seems needed. |

Left issue on Tx profile report

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals and Moderator’s remark** | **Moderator’s recommendation** |
| R2-2200483 | HW | Proposal 18: For Rel-17 TX UE, UE reports TX profile information associated with DST L2 ID in SUI message, to assist the alignment of the Uu DRX of TX UE and SL DRX of RX UE, and to assist the SL transmission of TX UE limited by active time of SL DRX. |  |

When Tx profile is introduced in LTE, the eNB awareness of the mapping between TX profiles and Destination L2 IDs is discussed by RAN2 and the following RAN2 view is concluded and sent to SA2(R2-1815665).

RAN2 view is that the eNB should be provided by the operator or V2X service provider with a mapping between TX profiles and Destination L2 IDs, e.g. as part of the UE subscription profile or via network implementation signalling.

And that RAN2 view is confirmed by SA2 and captured in their spec (23.285):

When the network scheduled operation mode is used, following additional principle applies:

 -When the eNB receives a request for PC5 resource from a UE, the eNB may deduce the Tx Profile from the Destination L2 ID.

NOTE 1: The mapping from Destination L2 ID to Tx Profile is configured in the eNB. The eNB can determine the Tx Profiles that the UE needs to use for transmitting the packets thus utilising the resources available appropriately (i.e. handling of sidelink grant), see TS 36.321 [26] for details.

Moderator understand the same principle and be applied in NR, i.e., gNB is aware of the mapping between L2 ID and Tx profile, no signalling from UE to gNB is needed for reporting Tx profile.

**Q2.2-2 (new issue): How for gNB to be aware of the mapping between L2 ID and Tx profile in NR?**

**Option-1: Reuse the LTE solution, i.e., no spec effort by RAN2;**

**Option-2: Rely on UE to report mapping, in SUI message, i.e., spec effort by RAN2**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 | We do not see a reason to deviate from LTE solution (especially considering the new solution requires new signaling). |
| Xiaomi | Option 1 |  |
| ZTE | 1 |  |
| Intel | Option 1 |  |
| **Ericsson** | **1** |  |

Based on the following EN in running-CR of 321

Editor’s Note: The RAN2 agreements of the Tx profile will be captured after completion of further discussion (format, contents and UE’s behaviour).

And the following EN in running-CR of 331

[Editor’s Note]: the actual capturing of TxProfile FFS.

Moderator understand it is necessary to add the Q:s for Tx profile. Firstly, on Tx profile format

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| **Tdoc** | **Company** | **Proposals and Moderator’s remark** | **Moderator’s recommendation** |
| R2-2200544 | LG Electronics France | Proposal 1: TX profile should include the following information at least:- Release identification- SL DRX ON/OFF  | Moderator understand this is already concluded in last RAN2 meeting. |

**Q2.2-3a (new issue): Do you agree that the Tx profile should include at least the information of**

**Information-1: Release identity**

**Information-2: DRX support or not**

|  |  |  |
| --- | --- | --- |
| **Company** | **Information** | **Comment** |
| OPPO | 1 and 2 | 1 is needed since for a same feature, there could be a difference between Rel-A and Rel-B version.2 is needed since we agree to adopt it at least. We have not see the need to add further info into Tx profile yet (partial-sensing/random-selection ,or IUC). |
| Xiaomi | Both | Release identity is agreed since LTE.DRX support or not is agreed in R17. |
| ZTE | 2 | At least information-2 is needed, for information-1, since it is the same as LTE, we are open to add it or not. |
| Intel | 1 and 2 | Seems both are needed since we need both the release info and DRX support for future proof design. |
| **Ericsson** | **2** | **We don’t understand the motivation for this question.** **RAN2 has already agreed that TX profile identifies feature, or feature group in RAN2#116, so why RAPP reopens the discussion?**[OPPO] we have not concluded on the content / format of the Tx profile yet, which led to the EN in the running-CR and the Q here. |

For the usage of Tx profile, moderator understand in LTE, 36.321 gives a baseline for the usage as follows

<firstly, for a grant, select a Tx profile based on the LCH of highest prio>

- consider the selected transmission format to be *SL-V2X-TxProfile* for the highest priority of the sidelink logical channel(s) in the MAC PDU (TS 36.331 [8]);

<Secondly, during LCP, select destination based on the >

- Step 0: Select a ProSe Destination, having the sidelink logical channel with the highest priority, among the sidelink logical channels having data available for transmission and having the same transmission format as the one selected corresponding to the ProSe Destination;

NOTE: The sidelink logical channels belonging to the same ProSe Destination have the same transmission format.

**Q2.2-4a (new issue): For the usage of Tx profile, do you agree, for a grant, select the Tx profile based on the LCH with highest prio?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | LTE solution is sufficient here. |
| Xiaomi | Comments | There seems to be some ambiguity in 36.321. Tx profile is associated with L2 ID, as discussed in Q2.2-1. Therefore, it’s better to make spec clear the Tx profile is selected based on L2 destination, which is decided based on LCH with highest priority. |
| ZTE | Comment | Agree with Xiaomi. Firstly, this issue may not exist. Even if it exist, we should not reuse the same solution as LTE since things are different.  |
| Intel | See comment | We also have same understanding as Xiaomi, i.e. the LCP shall follow LCH selection based on priority and the associated TX profile corresponding to the selected LCH is then used. |
| **Ericsson** | **agree** | **We shall reuse the LTE solution if it is feasible** |

**Q2.2-4b (new issue): For the usage of Tx profile, to generate a MAC PDU for a grant, which option do you prefer**

**Option-1: since all LCHs for a same destination has the same Tx profile, it is sufficient to consider the selected Tx profile during destination-selection step**

**Option-2: since not all LCHs for a same destination has the same Tx profile, it has to consider the selected Tx profile during both destination-selection and LCH-selection step**

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| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | Depends on the output of **Q2.2-1a** | No strong view here, but should align with **Q2.2-1a** |
| Xiaomi | Option 1 | Tx profile is associated with L2 ID, as discussed in Q2.2-1. Therefore, all LCHs associated with the same destination should have the same Tx profile. |
| ZTE | 1  | We think Tx profile shall be associated with L2 ID for groupcast and broadcast based on SA2 specification. For unicast, we shall send a LS to ask SA2 to provide only one Tx profile for each DCR message. |
| Intel  | Option 1 |  |
| **Ericsson** | **Option 2** | **For the same L2 ID, there may be multiple service types associated with multiple TX pfiles. Therefore, both destination selection and LCH selection shall consider TX profile.** |

For the implementation of QoS profile for DRX configuration

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals and Moderator’s remark** | **Moderator’s recommendation** |
| R2-2200483 | Huawei, HiSilicon | Proposal 8: RAN2 to discuss on implementing a QoS profile in BC/GC DRX configuration by an index, if it is also configured in RB configuration. |  |
| R2-2201585 | Samsung | [Proposal 3]: For GC/BC, SL-QoS-Profile-r16 is reused to map between SL DRX cycle length and QoS profile. |  |

**Q2.2-5 (new issue): Do you agree to discuss on implementing a QoS profile in BC/GC DRX configuration by an index, if it is also configured in RB configuration?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Lean to disagree, can follow majority view. | Although good to have optimization on signaling, given we adopt the SIB segmentation for SIB12 since R16, there is no big problem any more. We can follow majority view here. |
| Xiaomi | No | If QoS profile is not configured in RB, index doesn’t work. So, we prefer to introduce one general solution. |
| ZTE | disagree | We have no strong opinion, can follow majority view. |
| Ericsson | disagree | We don’t think this is critical issue, can be categorized as optimization. No need to discuss this at such late stage. |

# Common Issues for all cast types

# RTT/Re-tx timer related

Left issue on Re-tx timer start or not upon PSFCH-ACK dropping, i.e., related to the following FFS from R2#116bis

17: For unicast, sl-drx-RetransmissionTimer is started after expiring sl-drx-HARQ-RTT-Timer when the PSFCH (NACK) transmission is dropped. FFS for ACK transmission dropping.

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 8: For sidelink unicast, sl-drx-RetransmissionTimer is started after the sl-drx-HARQ-RTT-Timer expires regardless of whether the unsent PSFCH is ACK or NACK. |  |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 20: For unicast, sl-drx-RetransmissionTimer is started after expiring sl-drx-HARQ-RTT-Timer when the PSFCH (NACK) transmission is dropped |  |
| R2-2200374 | OPPO | Proposal 8 For P22 of [716], for ACK/NACK FB case, sl-drx-RetransmissionTimer is started after expiry of sl-drx-HARQ-RTT-Timer only if the dropped PSFCH transmission is NACK. |  |
| R2-2200483 | HW | Proposal 4: If the RX UE does not transmit PSFCH for a HARQ enabled transmission (e.g. due to UL/SL prioritization), and HARQ RTT timer expires, the RX UE starts retransmission timer regardless of whether the data corresponding to the unsent PSFCH was decoded successfully or not. |  |

Based on the online discussion result, moderator observe the majority view is clear.

**Q2.3.1-1 (old issue): For unicast, should *sl-drx-RetransmissionTimer* be started after expiry of *sl-drx-HARQ-RTT-Timer* when the PSFCH of ACK transmission is dropped or not?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Started / Not started** | **Comment** |
| OPPO | Not Started | Not see the reason to deviate from legacy scenario. If started, it adds no benefit but just waste Rx-UE power since the packet has already received successfully. |
| Xiaomi | Started | Peer UE would consider lack of feedback as NACK and perform retransmission. UE should wake up to receive the retransmission and more importantly respond ACK, otherwise peer UE would continuously perfrom retransmission, since UE would not transmit feedback to following retransmission. |
| ZTE | Started | For this case the TX UE may perform retransmission, if *sl-drx-RetransmissionTimer* is not started, the RX UE may not receive thisretransmission and give no feedback again. Then the TX UE may continue to perform retransmission again and again. |
| Intel | Not started | We think this has more to do with the alignment of the timers, since otherwise there is not much reason to start the timer if the PSFCH ACK was dropped. |
| **Ericsson** | **Not start** | **No. We don’t see clear motivation for starting RetransmissionTimer in this case (lose power saving benefit)** |

RTT timer start position if FB-disabled

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 9：when PSFCH is not configured and SL HARQ feedback is disabled，the SL HARQ RTT, if configured and resource assignment information (SCI-based RTT timer) is not present, is started at the first slot after the end of last PSSCH resource. | FB disabled + no Re-tx resource in SCI + PSFCH not configured |
| R2-2200318 | CATT | Proposal 10: when PSFCH is configured and SL HARQ feedback is configured to be disabled, the SL HARQ RTT, if configured and resource assignment information (SCI-based RTT timer) is not present, is started at the first slot after the end of last PSSCH resource. | FB disabled + no Re-tx resource in SCI + PSFCH configured |
| R2-2200483 | HW | Proposal 7: For HARQ feedback enabled case, when SCI indicates a retransmission resource, the value of HARQ RTT timer should be derived by n-k, where n is the time gap between the current transmission resource and the next reserved retransmission resource, and k is time gap between the current transmission resource and the SL HARQ feedback resource. | FB-enabled + Re-tx resource in SCI |
| R2-2200535 | LG Electronics France | Proposal 5. If resource assignment information exists in the SCI, the Rx UE can start the SL HARQ RTT timer for each PSSCH resource scheduled in the SCI, and the SL HARQ RTT timer can be running until the next retransmission resource. | Re-tx resource in SCI |
| R2-2200535 | LG Electronics France | Proposal 6. If there is no resource assignment information in the SCI, the Rx UE uses the SL DRX HARQ RTT timer (zero value or non-zero value) configured by the gNB. And Rx UE can start the SL HARQ RTT timer in the first slot after the corresponding PSSCH resource. | No Rx-tx resource in SCI |
| R2-2201152 | InterDigital | Proposal 1: For HARQ feedback disabled or PSFCH not configured, the RX UE starts the HARQ RTT timer upon reception of SCI.  | Feedback disabled + PSFCH not configured |

moderator understand the existing agreement so far on RTT timer starting position is valid at least for the case where SCI does not indicate re-tx resource and FB is enabled, so the following question is to confirm the validity of the agreement for other cases.

22: For transmissions with HARQ feedback, the RX UE starts the SL HARQ RTT timer in the symbol/slot following the end of PSFCH transmission.

23: If the RX UE does not transmit PSFCH for a HARQ enabled transmission (e.g. due to UL/SL prioritization) the RX UE still starts the HARQ RTT timer in the symbol/slot following the end of PSFCH resource.

**Q2.3.1-2a (old issue): For resource pool with PSFCH, do you agree whether the above agreement (RTT timer starts at end of PSFCH) holds for FB disabled case?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | As long as PSFCH is configured, the minimum gap restriction between two adjacent transmission holds, regardless of whether FB is enabled or disabled. |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| **Ericsson** | agree |  |

**Q2.3.1-2b (old issue): For resource pool with PSFCH, whether the above agreement (RTT timer starts at end of PSFCH) holds for the case where SCI indicating re-tx resource?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Disagree | It seems easier to use the RTT timer for such case as well, and start from in the slot following the end of PSSCH resource.And thus it can be applied to the case of resource pool without PSFCH + SCI indicating re-tx resource as well. |
| Xiaomi | No | RTT should start after PSSCH. |
| ZTE | Disagree |  |
| Intel | Disagree |  |
| **Ericsson** | **comments.** | **No strong view. However, it may be beneficial to start the RTT timer after PSSCH.** |

**Q2.3.1-2c (old issue): For resource pool without PSFCH, do you agree RTT timer starts in the slot following the end of PSSCH resource (for both SCI indicating re-tx resource and not indicating re-tx resource)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| Ericsson | agree |  |

Left issue on applicable scenario for RTT timer and Re-tx timer

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator‘s remark and recommendation** |
| R2-2201152 | InterDigital | Proposal 3: Two separate HARQ retransmission timers are configured and used by the UE for HARQ enabled transmissions versus HARQ disabled/PSFCH not configured.  |  |
| R2-2201152 | InterDigital | Proposal 2: Two separate HARQ RTT timers are configured and used by the UE for HARQ enabled transmissions versus HARQ disabled/PSFCH not configured.  | Moderator understand the agreement below has covered the intention9: HARQ RTT is supported for both HARQ enabled and HARQ disabled cases by allowing HARQ RTT timer to be set to different values. FFS on the specific values that can be used for HARQ disabled case.While the only uncovered case is PSFCH-not-configured |
| R2-2200938 | Ericsson | Proposal 15 RAN2 to discuss how to set the HARQ RTT timer value in a SL DRX configuration for it to work for both HARQ-disabled case and HARQ-enabled case but the timer value cannot be deduced from SCI. | Considering now the running-CR is implemented in a way that the DRX configuration is set independent from the resource pool configuration, moderator understand the agreement below means that two values can be configured for FB-enable/disable case respectively, and UEs can use correspondingly9: HARQ RTT is supported for both HARQ enabled and HARQ disabled cases by allowing HARQ RTT timer to be set to different values. FFS on the specific values that can be used for HARQ disabled case. |
| R2-2200373 | OPPO | Proposal 14 Allow different RTT timer setting for 1) resource pool with PSFCH and FB enabled case, 2) resource pool with PSFCH and FB disabled case, and 3) resource pool without PSFCH. |  |

Given the existing agreement, moderator understand RTT timer is also necessary for FB disabled case, so the question is just whether to differentiate between pool with and without PSFCH

HARQ RTT is supported for both HARQ enabled and HARQ disabled cases by allowing HARQ RTT timer to be set to different values. FFS on the specific values that can be used for HARQ disabled case.

**Q2.3.1-3a (old issue): For resource pool where PSFCH is not configured, in case SCI does not indicate re-transmission resource, how to decide the RTT timer length?**

**Option-1: use a same RTT timer length value, i.e., a same value for FB-disabled case regardless whether PSFCH is configured or not**

**Option-2: use different RTT timer length value, e.g., fix the length of RTT timer length for pool without PSFCH to be zero**

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| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 | Different from the pool with PSFCH, the minimum gap requirement does not need to be considered, so a shorter / zero RTT timer is feasible. |
| Xiaomi | Option 2 | According to the agreement, different RTT timer should be used for HARQ feedback enabled and HARQ feedback disabled cases. |
| ZTE | 2 |  |
| Intel | Option 2 |  |
| Ericsson | 1 | It would be easier to use a same length value in this case. The gNB only needs to configure a single value. |

**Q2.3.1-3b (new issue): For Re-tx timer, do you think a single value is sufficient to cover all cases (FB-enable/disable, PSFCH configured/not-configured), or is there a need to use different values for different cases?**

**Option-1: single value is sufficient**

**Option-2: multiple values are needed (if this option is selected, plz indicate which scenario(s) have to be differentiated by configured different values)**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 | Have not identify the need of different timer length yet. |
| Xiaomi | 1 |  |
| ZTE | 1 |  |
| Intel | 1 |  |
| Ericsson | 1 |  |

Considering there is an agreement this meeting

6: drx-HARQ-RTT-TimerSL is supported in case PSFCH is configured in resource pool and sl-PUCCH-Config is not configured. NW can set value as zero or any other value.

There is comment by companies that the following issue should be further clarified

**Q2.3.1-4 (new issue): Whether *drx-HARQ-RTT-TimerSL* is supported or not in case PSFCH is not configured in resource pool and *sl-PUCCH-Config* is not configured.**

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| --- | --- | --- |
| **Company** | **Supported / Not supported** | **Comment** |
| OPPO | Supported with a different value (e.g., zero)  | We are open to use a different timer length on this while keep it to align the spec between different cases.And can compromise if majority view on not using it. |
| Xiaomi | Yes | RTT timer should start after PDCCH transmission. |
| ZTE | Supported with comments | To Reduce implementation complexity, no matter PSFCH is configured or not, only one drx-HARQ-RTT-TimerSL is supported. |
| Intel | Supported | In order to align the behavior, we are fine to support the timer with a zero value |
| **Ericsson** | **Not support** | **We don’t see the need to have *drx-HARQ-RTT-TimerSL* in this case. For the sake of consistency of specification, we are ok to have it but the value is fixed to 0** |

One left issue as pointed out by the following paper

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator‘s remark and recommendation** |
| R2-2200484 | Huawei, HiSilicon | Proposal 2: Correct “sl-PUCCH-Config is configured or not” to “PUCCH resource is scheduled or not”. | 6: drx-HARQ-RTT-TimerSL is supported in case PSFCH is configured in resource pool and sl-PUCCH-Config is not configured. NW can set value as zero or any other value.For the left issue, suggest to rely on running-CR discussion. |

**Q2.3.1-5 (new issue): Do you agree that the conclusion for “*sl-PUCCH-Config* is not configured” also applied to “*sl-PUCCH-Config* is configured but PUCCH resource is not scheduled”?**

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| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | There seems a point in 0484-P2. |
| **Xiaomi** | **No strong view** | We don’t think this is a typical configuration. Can follow majority. |
| **ZTE** | **No strong view** | We do not think this case shall be considered. |
| **Ericsson** | **disagree** | **We don’t think this is a real issue. A reasonable gNB implementation can avoid this issue.** |

# Retransmission grant dropping due to DRX inactive time

Left issue on whether retransmission grant can be used for initial transmission, in case the initial transmission grant was dropped with no MAC PDU generated

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| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200483 | HW | Proposal 10: UE obtains MAC PDU for a SL grant for a retransmission, if UE obtains no MAC PDU for the corresponding prior SL grant. | Moderator understand the current spec allows it for mode-1 CG resource already, but not for mode-1 DG and mode-2 grant yet. 1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in a sl-PeriodCG of the configured sidelink grant: |

**Q2.3.2-1a (old issue): For mode-1 DG, if the initial transmission occasion was dropped due to no Rx-UE in DRX active time, do you agree TX-UE can use re-transmission occasion for initial transmission?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Can align with CG. |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| **Ericsson** | **comment** | No strong view |

**Q2.3.2-1b (old issue): For mode-2 grant, if the initial transmission occasion was dropped due to no Rx-UE in DRX active time, do you agree TX-UE can use re-transmission occasion for initial transmission?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | Can align between mode-1 and mode-2. |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| **Ericsson** | **comment** | No strong view |

Left issue on reporting A/N for re-transmission grant dropping

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| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200374 | OPPO | Proposal 2 For P8/9 of [716], for both initial transmission and re-transmission, if a mode-1 SL grant is dropped due to not in SL active time of any destination that has data to be sent, UE sends ACK to gNB by following the current MAC specification. |  |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 11: when mode 1 SL grant is not in SL active time of any destination that has data to be sent to, for initial transmission or retransmission and the mode 1 grant is dropped, UE sends ACK to gNB |  |
| R2-2200790 | Xiaomi | Proposal 4: UE set NACK in PUCCH if SL grant for retransmission was dropped. |  |
| R2-2200938 | Ericsson | Proposal 32 The TX UE sends NACK to the serving gNB if the mode 1 SL grant is dropped and sl-PUCCH-Config is configured. |  |
| R2-2201061 | ZTE Corporation, Sanechips | Proposal1: For both initial transmission and retransmission, it is suggested for UE to indicate NACK to gNB if mode1 SL grant is not in SL active time of any destination. |  |
| R2-2201135 | Apple | Proposal 3 when mode 1 SL grant is not in SL active time of any destination that has data to be sent, UE sends NACK to gNB if initial transmission or retransmission is dropped. |  |

One point raised by HW is that there might be a difference considering HARQ buffer is empty or not, where the former case (empty HARQ buffer) is the same as for initial transmission (for which ACK was agreed), since UE can make use of the grant for initial transmission (at least for CG, see Q2.3.2-1a/b above)

**Q2.3.2-2a (old issue): For mode-1 re-transmission grant, if the MAC PDU has been generated (i.e., the initial transmission has been performed), and the re-transmission grant is dropped due to no Rx-UE in active time, whether Tx-UE should report ACK or NACK to network via PUCCH?**

|  |  |  |
| --- | --- | --- |
| **Company** | **ACK / NACK** | **Comment** |
| OPPO | ACK | Since both ACK and NACK are problematic in some sense, we tend to align between cases to simplify UE implementation. |
| Xiaomi | NACK | With NACK, UE can still retransmit the generated MAC PDU in future active time. With ACK, the generated MAC PDU would be discarded resulting in data loss, since gNB would not schedule retransmission. |
| ZTE | NACK | The UE needs another sidelink resource to perform retransmission. Sending ACK will not acquire sidelink resource for retransmission. |
| Intel | NACK | Technically, it makes more sense to report NACK in this case. |
| **Ericsson** | **NACK** | **reporting NACK, gNB will assign retransmission resource to UE for more retransmissions**  |

**Q2.3.2-2b (old issue): For mode-1 re-transmission grant, if the MAC PDU has NOT been generated (i.e., the initial transmission has NOT been performed), and the re-transmission grant is dropped due to no Rx-UE in active time, whether Tx-UE should report ACK or NACK to network via PUCCH?**

|  |  |  |
| --- | --- | --- |
| **Company** | **ACK / NACK** | **Comment** |
| OPPO | ACK | This is exactly the same case for initial transmission (i.e., grant provided but not used since there is no Rx-UE in active time), so should be aligned. |
| Xiaomi | NACK | As responded in Q2.3.2-1a, we support UE can still use retransmission occasion for initial transmission, so sending NACK is feasible solution and common design is achieved regardless whether MAC PDU generated or not. |
| ZTE | NACK | Same comments as in Q2.3.2-1a, we think a unified solution shall be used. |
| Intel | NACK | Align with the case above |
| **Ericsson** | **ACK** | **Since MAC PDU is not generated, therefore, further retransmission can not be initialted. It is safe to report ACK in this case and rely on upper layer to trigger retransmission.** |

Based on the following agreement

6: drx-HARQ-RTT-TimerSL is supported in case PSFCH is configured in resource pool and sl-PUCCH-Config is not configured. NW can set value as zero or any other value.

One left issue is the starting position of *drx-HARQ-RTT-TimerSL* in such case.

**Q2.3.2-3a (new issue): In case PSFCH is configured in resource pool and *sl-PUCCH-Config* is not configured, when to start the starting position of *drx-HARQ-RTT-TimerSL*?**

**Option-1: at the first symbol after end of PSFCH resource;**

**Option-2: at the first symbol after end of PDCCH resource;**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 | Which is also applicable to PSFCH not configured case. |
| Xiaomi | Option 2 | We understand the gNB can send DCI scheduling retransmission right after DCI scheduling initial transmission, since DCI could schedule sidelink transmission grant in future. There is no timing restriction between PSFCH and DCI scheduling retransmission. |
| ZTE | 2 |  |
| Intel | 2 |  |
| Ericsson | 2 | **option 2 because the gNB does not know whether HARQ FB is enabled or disabled in the SL (even though the PSFCH resources are configured).** |

**Q2.3.2-3b (new issue): In case one answers Yes to Q2.3.1-4, i.e., in case *drx-HARQ-RTT-TimerSL* is supported when PSFCH is not configured in resource pool and *sl-PUCCH-Config* is not configured, when to start the starting position of *drx-HARQ-RTT-TimerSL*?**

**Option-1: at the first symbol after end of PSFCH resource;**

**Option-2: at the first symbol after end of PDCCH resource;**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 | Which is also applicable to PSFCH configured case. |
| Xiaomi | 2 | RTT timer should start after PDCCH transmission. |
| ZTE | 2 |  |
| Intel | 2 |  |
| Ericsson | 2 | **option 2 because the gNB does not know whether HARQ FB is enabled or disabled in the SL (even though the PSFCH resources are configured).** |

# DRX vs. Resource selection

Left issue on how to specify the behaviour for MAC layer to provide active-time to PHY layer

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200374 | OPPO | Proposal 6 For P15 of [716], MAC layer provides active-time to PHY layer for resource set determination, where the generation of active-time is by UE implementation. |  |
| R2-2200535 | LG Electronics France | Proposal 4. The MAC layer can provide the RX UE’s active time where SL DRX timers are running now or will be running in future (on-duration timer, Inactivity timer, retransmission timer) to the physical layer. |  |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 15: The format of active time content of RX UE provided by the MAC layer to the physical layer is up to UE implementation |  |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 16: TX UE can select TX resources within RX UE’s active time consider timers that are running, and timers that can be predicted to running, for both single MAC PDU and multiple MAC PDU cases, and for both initial transmission and retransmission cases. |  |
| R2-2200938 | Ericsson | Proposal 6 When providing active time to the Physical layer, the MAC layer prefilters destinations, to minimize the possibility that transmission to a destination cannot be made due to no overlapping between the SL grant and the active time of the destination. |  |
| R2-2200938 | Ericsson | Proposal 8 For a given destination, what type of active time (i.e., current or future active time) to be included in the active time provided by the MAC layer to the PHY layer is up to Tx UE implementation. |  |
| R2-2201478 | ITL | Proposal 1: MAC layer provide PHY layer with the Rx UE’s current active time and the other DRX related information (e.g., inactivity timer) to decide the Rx UE’s future active time |  |
| R2-2201150 | InterDigital | Proposal 1: RX UE active time for resource selection of an initial transmission resource includes current or future/expected time in which on duration (for all cast types) or inactivity timer (for unicast/groupcast only) at the RX UE are running.  |  |
| R2-2201135 | Apple | Proposal 7 How MAC layer provide “active time” to PHY layer should be specified. |  |
| R2-2201061 | ZTE Corporation, Sanechips | Proposal2: For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time. How to identify the RX UE’s active time can be up to UE implementation.  |  |

This issue was discussed in Post-116 [716], which the following result

**Rapporteur Summary: Out of 18 companies**

**Option-a: 4 (RX UE’s active time where SL DRX timers are running now.)**

**Option-b: 3 (RX UE’s active time where on duration timer will be running in future.)**

**Option-c: 0 (RX UE’s active time where inactivity timer will be running in future.)**

**Option-d: 0 (RX UE’s active time where retransmission timer will be running in future.)**

**Option-e: 14 (UE implementation)**

I.e., clear majority on leave it to UE-implementation instead of specifying all the details.

So moderator suggest a WF as follows.

1) Use normative text to capture that active-time is to be provided by MAC layer to PHY layer

2) Leave the details to UE implementation, including cast-type / destination selection, which timer to define the active-time, which can rely on NOTE

3) further details up to MAC running-CR discussion.

Examples can be as follows (based on 0550):

2> if the TX resource (re-)selection is triggered as the result of the TX resource (re-)selection check:

3> if one or multiple SL DRX is configured:

4> indicate SL DRX Active time of UE receiving SL-SCH data to the physical layer.

NOTE 3C: How the MAC entity determines active time is left to UE implementation.

**Q2.3.3-1a (old issue): Do you support to capture the “MAC layer provides active-time to PHY layer” as normative text?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Support / Not support** | **Comment** |
| OPPO | Support |  |
| Xiaomi | Yes |  |
| ZTE | Support |  |
| Intel | Support |  |
| **Ericsson** | **Yes** |  |
| Sharp | Support |  |

**Q2.3.3-1b (old issue): Do you agree to leave cast-type / destination selection, DRX timer selection within the active-time derivation to UE implementation (including the possibility to capture using a NOTE)**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | The key point is that we do not see another way to reach consensus on all the details one-by-one in the limited time left.And also it is the output from Post-116 [716]. |
| Xiaomi | Yes |  |
| ZTE | Agree  |  |
| Intel | See comment | We are a bit unsure to agree to such a blanket statement at this time when we have not discussed the details, but if majority companies think adding a note to that effect is sufficient, it is also fine. |
| **Ericsson** | **disagree** | **NO for destination selection: we think it is necessary to have some rules to pre-filter destinations before determining Active time to indicate to MAC.****YES for active time determination given a selected destination.** |
| Sharp | Agree |  |

Left issue on impact on resource selection due to DRX impact

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200374 | OPPO | Proposal 7 For P16/17 of [716], MAC layer selects resources for (re)transmission based on the resource set reported by PHY layer taking into account of the DRX information, but the detailed selection behaviour is up to UE implementation. |  |
| R2-2200483 | HW | Proposal 11: A retransmission resource can be selected if it is in active time updated according to its prior transmission, or if it can be indicated by a prior SCI. |  |
| R2-2200535 | LG Electronics France | Proposal 1. For single MAC PDU transmission, the TX UE shall select initial transmission resource and retransmission resources in the RX UE’s active time where SL DRX timers are running now or will be running in future (on-duration timer, inactivity timer, retransmission timer).  |  |
| R2-2200535 | LG Electronics France | Proposal 2. Resource selection for single MAC PDU transmission can be equally applied to the resource selection for the initial period for the multiple MAC PDUs transmission of the TX UE. |  |
| R2-2200535 | LG Electronics France | Proposal 3. Assuming that the announced periodic transmissions of the Tx UE is considered as the SL DRX active time of the Rx UE, the Tx UE can perform resource selection from the resources (announced periodic transmissions) of the non-initial period for multiple MAC PDU transmission. | Delta part due to the reservation period field |
| R2-2200938 | Ericsson | Proposal 10 For initial transmission and retransmission, both in case of single MAC PDU and multiple MAC PDUs, it is simplest for the TX UE to select resources based on the existing MAC procedures. RAN2 considers other options if their benefits are justified.  |  |
| R2-2201061 | ZTE Corporation, Sanechips | Proposal2: For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time. How to identify the RX UE’s active time can be up to UE implementation.  |  |
| R2-2201478 | ITL | Proposal 2: For the initial transmission, MAC layer should select the resource within the current Rx UE’s active time which would include both SL DRX timers are running now and on-duration timer will be running in future  |  |
| R2-2201478 | ITL | Proposal 3: For the retransmission, MAC layer could select the resource within the current & future Rx UE’s active time |  |
| R2-2201150 | InterDigital | Proposal 2: For one-shot unicast/groupcast transmissions, the TX UE selects a resource for the initial transmission from the set of resources in the RX UE’s active time. |  |
| R2-2201150 | InterDigital | Proposal 3: For one-shot unicast/groupcast transmissions, the TX UE selects at least N retransmissions within the RX UE’s active time.Proposal 4: The minimum number of retransmission resources (N) that should be selected from the RX UE’s active time is configured per priority and CBR.  | Single paper to propose a minimum number of retransmission resource (N), moderator suggest not to prioritize it for now |
| R2-2201150 | InterDigital | Proposal 5: For one-shot broadcast transmissions, the TX UE selects resources for the initial transmission and all retransmissions within the RX UE’s active time. Proposal 6: For multi-shot transmissions, the TX UE selects the resources for the initial transmission of the first TB of the multi-shot transmission from the active time of the RX UE(s). Same rules for the retransmission resources as for one-shot are applied.  | Delta part due to no inactivity/re-tx timer for BC |
| R2-2201150 | InterDigital | Proposal 7: MAC Layer selects resources associated with the active time of at least the highest priority L2 destination ID with data available for transmission and having DRX configured.  |  |
| R2-2200938 | Ericsson | Proposal 20 For groupcast, the TX UE can only select the resources for the initial transmission associated with the time in which the on-duration timer at the TX UE is running. | Delta part due to GC |
| R2-2200894 | vivo | Proposal 4: RAN2 to agree that MAC layer should prioritize to select resources in subset 1 for initial transmission and retransmission. |  |
| R2-2200894 | vivo | Proposal 5: RAN2 to discuss whether/when MAC layer can select resources in subset 2 for initial transmission and/or retransmission. |  |
| R2-2200483 | Huawei, HiSilicon | Proposal 5: For SL groupcast, initial transmission is only allowed during the time when onduration timer or inactivity timer is running, and retransmission of a SL process is only allowed during the time when onduration timer, inactivity timer, or the retransmission timer of this SL process is running. |  |

By reading all proposals, there are quite some points for which paper(s) proposed (for which moderator understand proponent looks for normative text finally). These points are summarized in the following table.

NOTE that we have the following agreement

TX UE shall select initial transmission resource only in the RX UE’s active time where SL DRX timers are running now or will be running in future (at least on-duration timer). Further details of active time can be considered later. FFS on spec impact.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Broadcast | Groupcast | Unicast  |
| Initial-transmission, Single-shot, and Initial-transmission of initial period, Multi-short | On-duration timer ?? + on-duration timer to be running in the future | On-duration timer + inactivity timer + retransmission timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future | On-duration timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future |
| Initial-transmission of non-initial period, Multi-short | On-duration timer ?? + on-duration timer to be running in the future?? + active time due to reservation period field | On-duration timer + inactivity timer + retransmission timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future?? + active time due to reservation period field | On-duration timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future?? + active time due to reservation period field |
| Re-transmission, Single-shot, and Re-transmission of initial period, Multi-short | On-duration timer ?? + on-duration timer to be running in the future?? + Retransmission timer to be running in the future | On-duration timer + inactivity timer + retransmission timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future | On-duration timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future |
| Re-transmission of non-initial period, Multi-short | On-duration timer ?? + on-duration timer to be running in the future?? + Retransmission timer to be running in the future?? + active time due to reservation period field | On-duration timer + inactivity timer + retransmission timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future?? + active time due to reservation period field | On-duration timer already running?? + on-duration timer to be running in the future?? + Inactivity timer to be running in the future?? + Re-transmission timer to be running in the future?? + active time due to reservation period field |

Where the bullet with ?? are the part that may have to be debated based on moderator observation, and considering the discussion in post-116 [716] as follows

Proposal 16: RAN2 should further discuss the options below for the Tx UE’s behaviour to select an initial transmission resource for single MAC PDU transmission.

a) (9/19)For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time where SL DRX timers are running now.

b) (9/19) For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time where on duration timer will be running in future.

c) (6/19) For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time where inactivity timer will be running in future.

d) (2/19) For initial transmission for single MAC PDU, the TX UE can select TX resource within RX UE’s active time where retransmission timer will be running in future.

e) (6/19) select resources according to the existing procedure in the MAC

Proposal 17: RAN2 should further discuss the options below for the Tx UE’s behaviour to select a retransmission resource for single MAC PDU transmission.

a) (9/19) For retransmission for single MAC PDU, the TX UE can select TX resources within RX UE’s active time where SL DRX timers are running now.

b) (9/19) For retransmission for single MAC PDU, the TX UE can select TX resources within RX UE’s active time where on duration timer will be running in future.

c) (9/19) For retransmission for single MAC PDU, the TX UE can select TX resources within RX UE’s active time where inactivity timer will be running in future.

d) (8/19) For retransmission for single MAC PDU, the TX UE can select TX resources within RX UE’s active time where retransmission timer will be running in future.

e) (6/19) select resources according to the existing procedure in the MAC.

Moderator understand it is hard to conclude on all details one-by-one given the controversial status and the limited, so would like to suggest a WF that

1) Use normative text to capture that MAC layer will select initial and re-transmission resource considering SL DRX timer that are running and will be running in the future.

2) Leave the details to decide “SL DRX timer that are running and will be running in the future” to UE implementation, including further difference between cast types selection, between destination selection, between initial/re-transmission, between single and multi-shot, which can rely on NOTE

3) further details up to MAC running-CR discussion.

Examples can be as follows (based on 0550):

<for initial transmission>

4> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] considering SL DRX timer that are running and will be running in the future, according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.

NOTE 3C: How the MAC entity determines SL DRX timer that are running and will be running in the future is left to UE implementation.

**Q2.3.3-2a (old issue): If aiming at a brief capturing in normative text, what do you support to capture ?**

**Option-1: “select resource considering SL DRX timer that are running and will be running in the future”?**

**Option-2: “select resource in SL active time”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 or 2 | We are open to both. |
| Xiaomi | Option 2 |  |
| ZTE | 2 | The description of select TX resource within RX UE’s active time is enough. How to identify the RX UE’s active time can be up to UE implementation.  |
| Intel | Option 2 | Since it seems we are skipping over the details of what/how timers would be running “in the future”, it seem better to not capture that part. |
| **Ericson** | **1 and 2** | should combine O1 and O2 to reflect the RAN2 agreement: “select resources in SL active time corresponding to SL DRX timer that are running and will be running in the future |
| Sharp | Option 2 | Regarding the examples above (based on 0550), we don’t think the selection quoted is necessarily for initial transmission, since in the following procedures, it reads “5>consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities;” and it clearly reveals that the quoted part is for initial transmission if no retransmission is selected, while if retransmission is selected, the resource for initial transmission is the first in time domain among all the selected resources, not necessarily the one in the above 4>. |

**Q2.3.3-2b (old issue): Do you agree to leave** **further difference between cast types selection, between destination selection, between initial/re-transmission, between single and multi-shot to UE implementation (including the possibility to capture using a NOTE)**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | The key point is that we do not see another way to reach consensus on all the details one-by-one in the limited time left,considering the controversial result from Post-116 [716]. |
| Xiaomi | Yes |  |
| ZTE | Agree  |  |
| Intel |  | Same comment as in Q2.3.3-1b |
| **Ericsson** | **disagree** | **we believe at least cast type differentiation is needed. In particular,** * **GC: due to the complex nature of GC where multiple UEs are involved in the communication, we believe the TX UE can only select the resources for the initial transmission associated with the time in which the on-duration timer at the TX UE is running.**
* **UC: the different options listed in the table above makes sense and quite simple to implement. E.g., at least On-duration timer already running + on-duration timer to be running in the future + either (or both) of inactivity timer or retransmission timer can be included. The active time due to reservation period field should be considered given the WA in RAN1#116b**

**BC is easy because there is only OnDuration timer.**  |
| Sharp | Agree |  |

Left issue on impact on resource re-selection of retransmission resources due to DRX re-transmission timer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200545 | SHARP Corporation | Proposal 1: For resource re-selection of the pre-emption check in SL DRX, the re-selected resource is not earlier than the pre-empted resource in time domain. |  |
| R2-2200545 | SHARP Corporation | Proposal 2: For resource re-selection of the pre-emption check in SL DRX, the time gap between the re-selected resource and the pre-empted resource is not larger than the duration of SL HARQ Retransmission timer. |  |
| R2-2200894 | vivo | Proposal 9: RAN2 further discuss, when pre-emption is allowed, Tx UE does not reselect a resource earlier than the pre-empted resource. |  |
| R2-2200894 | vivo | Proposal 10: RAN2 kindly asks RAN1 to consider the issue of the miss-reception on the resource reselection if the resource revaluation and/or pre-emption are enabled. Details is up to RAN1. |  |
| R2-2200894 | vivo | Proposal 11: If Proposal 10 is agreed, RAN2 sends an LS to RAN1 for feedback (see Annex). |  |
| R2-2200894 | vivo | Proposal 12: Relying on the SCI-based resource reservation, RAN2 studies the determination mechanism for HARQ RTT timer by setting the warm-up window. |  |
| R2-2201150 | InterDigital | Proposal 9: A TX UE which performs re-selection of retransmission resources due to pre-emption ensures that the newly selected re-transmission resource does not occur earlier in time than the pre-empted resource when communicating to an RX UE in DRX |  |
| R2-2201150 | InterDigital | Proposal 10: If RAN2 agrees to the above proposal, send LS to inform RAN1. |  |

Moderator understand it is the result of introducing SCI based RTT timer, and the resource reselection operation is done at MAC layer after receiving set-A reported by PHY layer.

**Q2.3.3-3a (old issue): Do you agree that for resource reselection due to pre-emption, the reselected resource should not be earlier than the pre-empted resource in time domain?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | Yes with comments | Furthermore, we think additional restriction should be added, i.e. the reselected resource should not be later than the pre-empted resource plus retransmission timer length. |
| ZTE | Disagree | This restriction may impacts on RAN1 since the pre-emption mechanism is totally designed by RAN1, so at least a LS to RAN1 is needed. Even if this restriction is not agreed, we can also handle this issue. For example, if pre-emption is enabled, the UE shall follow the behaviors as the case that SCI does not indicate re-transmission resource. |
| Intel | Agree |  |
| **Ericsson** | **disagree** | **while we see some value of this, we think any reasonable UE implementation will do it that way and therefore no need to specify it.** |
| Sharp | Yes | We share same view as Xiaomi. |

**Q2.3.3-3b: If yes to 3a, is there a need to send LS to R1?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Send LS / not send LS** | **Comment** |
| OPPO | Not send LS | Do not see the need since it is a MAC layer behaviour. |
| **Xiaomi** | No |  |
| **Ericsson** | No |  |
| Sharp | Not send LS | Share the view as OPPO |

Left issue on the need of resource (re)selection trigger considering DRX impact

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200318 | CATT | Proposal 12: For mode 2 Tx UE, resource (re)selection needs to be triggered when there is no SL grant can be used in SL DRX active time for the destination which has SL data available for transmission. And the (re) selected SL grant shall be in SL DRX active time. |  |
| R2-2200483 | HW | Proposal 12: If the current reserved resources do not fall into the SL DRX active time of any destination, or if there is no SL grant in the SL active time of the destination that has data to be sent, resource (re)selection is triggered. |  |
| R2-2200545 | SHARP Corporation | Proposal 3: If SL DRX is configured or re-configured, e.g. leading to the change of active time, MAC entity shall trigger the TX resource (re-)selection. | Single paper for the proposal, moderator suggest not to prioritize for now |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 6: Resource (re)selection triggers to PHY are a) when new data becomes available for transmission and on-duration timer is running; b) when Inactivity timer is (re)started and c) when CSI request is sent to the Rx UE. | Single paper for the proposal, moderator suggest not to prioritize for now |
| R2-2200762 | Lenovo, Motorola Mobility | Proposal 7: MAC can trigger resource selection with PHY in the next start of on-duration timer i.e., in the next DRX cycle period when PDB still allows it, if the remaining active time is less than T1. | Single paper for the proposal, moderator suggest not to prioritize for now |
| R2-2200938 | Ericsson | Proposal 9 The MAC layer triggers resource reselection if the MAC layer cannot find sufficient resources in the reported set of resources to be aligned with the active time of the desired destination. |  |
| R2-2201150 | InterDigital | Proposal 8: A TX UE triggers resource (re)selection if there are no selected sidelink grants which fall in the active time of a L2 destination ID having data available for transmission.  |  |

This issue has been discussed in At-116 [706], with the following minutes

[Proposal 8] RAN2 to choose among below options for triggering resource (re)selection:

Option 1: If the current reserved resources do not fall into the SL DRX active time of any destination. (10/18)

Option 2: If there is no SL grant in the SL DRX active time of the destination that has data to be sent. (13/18)

Option 3: If the MAC layer cannot find resources in the reported set of resources to be aligned with the active time of any desired Destination. (6/18)

Option 4: No trigger needed. (3/18)

* Skipped.

Moderator suggest to focus on the option-1/2 to make final conclusion

**Q2.3.3-4 (old issue): Do you agree to introduce additional resource reselection trigger as follows?**

**Option 1: If the current reserved resources do not fall into the SL DRX active time of any destination.**

**Option 2: If there is no SL grant in the SL DRX active time of the destination that has data to be sent.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | None | 1 is not needed since we already had a solution, i.e., to drop the grant.2 should not happen given the active-time based resource selection. |
| Xiaomi | None | Option 1 is not valid, since we agreed UE consider reserved resource as active time in 116b.Option 2 is not valid, since PHY design can ensure the grant is fall into the active time of destination UE. |
| ZTE | 2 | We are not sure whether PHY design can ensure the grant is fall into the active time of destination UE at any time. We are open to add this option.  |
| Intel | 2 (see comment) | As ZTE mentioned, there was some discussion in RAN1 in the previous meeting on how to handle the case when PHY layer cannot select sufficient resources that fulfil the active time criterion indicated by the MAC layer. While different options were proposed, it seems RAN1 has agreed that there will be no further optimizations on the resource (re)selection procedure with regard to SL DRX operation in Rel.17.Therefore, there is a very likely possibility that the indicated set of candidate resources do not fall within the DRX active time of the selected destination. In this case, RAN2 needs to decide what to do and in our view, the simplest way is to add an additional resource reselection trigger to handle this case. |
| **Ericsson** | **2** |  |
| Sharp | Option 1 or 2 |  |

# Capability

# Capability for SL-DRX

Left issue on UE capability for SL-DRX

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator’s remark and recommendation** |
| R2-2200373 | OPPO | Proposal 6 For R17 SL Broadcast and Groupcast, support DTX as conditionally mandatory per-UE capability without capability bit in PC5-RRC, and FFS whether to define DRX capability as mandatory or optional per-UE capability without capability bit in PC5-RRC. |  |
| R2-2200373 | OPPO | Proposal 7 For R17 SL unicast, for the capability of DCR message delivery, follow the same conclude for broadcast and groupcast. |  |
| R2-2200373 | OPPO | Proposal 8 For R17 SL unicast, define DTX/DRX capability for SL unicast data transmission as optional per-UE capability with capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiation. FFS whether separate capability is needed for DTX and DRX. |  |
| R2-2200373 | OPPO | Proposal 9 For R17 SL unicast, define DTX/DRX capability for SL unicast data transmission as optional per-UE capability with capability bits in Uu-RRC. Follow the conclusion in Proposal 7 above on whether to define separate capability bit for DTX and DRX. |  |
| R2-2200373 | OPPO | Proposal 10 For R17 SL broadcast and groupcast, if Proposal 9 concludes that DRX capability being optional, define per-UE DRX capability bit for SL broadcast and groupcast in Uu-RRC. FFS whether to define separate capability bit for broadcast and groupcast. FFS whether to define capability bit for DTX in Uu-RRC. |  |
| R2-2200373 | OPPO | Proposal 11 For R17 SL, RAN2 discuss whether to define capability of SL-related RTT timer and Re-transmission timer for PDCCH monitoring as conditionally mandatory or optional per-UE capability with capability bit. with no FR1-FR2 or FDD-TDD differentiation. |  |

Firstly, question on whether to define different capability for cast-types, DTX for Tx-UE and DRX for Rx-UE.

**Q2.3.4-1a (new issue): Do you prefer to define separate capability for different cast types (except for UC-based DCR message, which is up to Q2.3.4-1c below)?**

**Option-1: a single capability covering all cast types**

**Option-2: separate capability for Unicast and for Broadcast + Groupcast**

**Option-3: separate capability for each cast type**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 2 | UC capability that can rely on PC5-RRC to exchange differ from BC/GC a lot, so a separation is needed.While there is no much difference further between BC and GC. |
| Xiaomi | Option 1 | We don't see much difference between different cast types. UE shall support all cast type DRX as a whole feature. One bit is enough. |
| ZTE | 1 | As we know, the UE does not separate capability for each cast type when report the sidelink capability to the gNB, similarly, we think a single capability covering all cast types is enough. |
| Intel | Option 1 | There is no reason identified in discussion so far requiring such differentiation  |
| **Ericsson** | **1** |  |

**Q2.3.4-1b (new issue): Do you prefer to define separate capability for Tx and Rx for DRX?**

**Option-1: single capability covering both Tx and Rx side**

**Option-2: separate capability for Tx and Rx side**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option** | **Comment** |
| OPPO | 1 or 2 | No strong view. |
| Xiaomi | Option 1 | We don't see much difference between Tx and Rx side. Tx and Rx UE should both be able to maintain the DRX timer running. One bit is enough. |
| ZTE | 1 | No strong view. |
| Intel | 1 |  |
| **Ericsson** | **1** |  |

**Q2.3.4-1c: For UC-based DCR message, do you agree to follow the conclusion of BC related capability?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | Yes |  |
| ZTE | Agree  |  |
| Intel | Agree |  |
| **Ericsson** | **agree** |  |

Secondly, question on the detailed attributive for each capability (regardless of whether combined or separate capability is defined, which will depend on the output of Q2.3.4-1a/b above)

And rapp made some clarification on the change if there is a view on using the single bit for all cases.

|  |  |  |  |
| --- | --- | --- | --- |
|  | UC | GC | BC |
| DTX | Optional per-UE capability with capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiationwith capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory per-UE capability Without capability bit in PC5-RRCWith capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory per-UE capability Without capability bit in PC5-RRCWith capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation |
| DRX | Optional per-UE capability with capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiationwith capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory per-UE capability Without capability bit in PC5-RRCWith capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory per-UE capability Without capability bit in PC5-RRCWith capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation |

**Q2.3.4-1d (new issue): for DTX + UC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel | See comment | We are fine in general with the classification. However, from the above table, it seems there is no need to differentiate between DTX and DRX at least |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

**Q2.3.4-1e (new issue): for DTX + GC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel |  | Same comment as in Q2.3.4-1d |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

**Q2.3.4-1f (new issue): for DTX + BC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel |  | Same comment as in Q2.3.4-1d |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

**Q2.3.4-1g (new issue): for DRX + UC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel |  | Same comment as in Q2.3.4-1d |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

**Q2.3.4-1h (new issue): for DRX + GC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel |  | Same comment as in Q2.3.4-1d |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

**Q2.3.4-1i (new issue): for DRX + BC case, any aspect in the table that you disagree?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | NO | Since we don’t see the need to differentiate between DTX and DRX or between cast types. One bit is enough. |
| ZTE | Disagree | We have no strong opinion, can follow the majority. |
| Intel |  | Same comment as in Q2.3.4-1d |
| Ericsson | disagree | We share the same view as xiaomi, 1 bit is sufficient |

# Capability for Uu-DRX

Left issue on UE capability for SL-DRX

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc** | **Company** | **Proposals**  | **Moderator‘s remark and recommendation** |
| R2-2200373 | OPPO | Proposal 11 For R17 SL, RAN2 discuss whether to define capability of SL-related RTT timer and Re-transmission timer for PDCCH monitoring as conditionally mandatory or optional per-UE capability with capability bit. With no FR1-FR2 or FDD-TDD differentiation. |  |

**Q2.3.4-2a (new issue): Do you agree to introduce capability of SL-related RTT timer and Re-transmission timer for PDCCH monitoring?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree | In order to differ from R16 and R17 UE. |
| Xiaomi | Yes |  |
| ZTE | Agree |  |
| Intel | Agree |  |
| **Ericsson** | **Agree** |  |

**Q2.3.4-2b (new issue): if yes to 2a above, do you disagree any component of the attributive of this capability (conditionally mandatory, per-UE, without FR1/2 diff, and without FDD/TDD diff)?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree / Disagree** | **Comment** |
| OPPO | Agree |  |
| Xiaomi | Agree |  |
| ZTE | Agree  |  |
| Intel | Agree |  |
| **Ericsson** | **Agree** |  |

# Phase-1 Summary

Recommendation: Moderator suggest to use the questions in section 2 for Phase-2 discussion.

# Phase-2 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