**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 |  |
| LG | Yes | We think the 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. |
| NEC | Agree |  |
| InterDigital | Agree | Its good to align the behaviour for all cast types. |
| Huawei, HiSilicon | Agree | The default SL DRX configuration for BC/GC can be used for DCR message transmitted via unicast manner. |
| CATT | Agree |  |
| vivo | Agree | In Rel-16, The destination Layer-2 ID used for DCR may be broadcast or unicast Layer-2 ID. However, when unicast Layer-2 ID is used, the Target User Info shall be included in the DCR message. Thus, we believe that, the “Yes” comes with the condition that the Target User Info is included in the DCR message. We also believe that, the on-duration timer and the inactivity timer can both be applied for both BC-based and UC-based DCR message. |
| Samsung | Agree |  |
| Nokia | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree | For UEs supporting SL DRX (i.e., Rel 17 UEs). |
| Lenovo | 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 options l Option 1: preconfigured SL DRX configuration for [DCR~DCA], per-PQI SL DRX configuration after DCA and until dedicated SL DRX configuration is completed l Option 2: preconfigured SL DRX configuration after DCR and until dedicated SL DRX configuration is completed l 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** |  |
| LG | Option 2 | SL DRX operation targets for power-saving UE. Therefore, even during the initial setup SL DRX configuration, it is necessary to be protected the power-saving motivation. So, we think the default SL DRX configuration for BC/GC has to be also applied to the messages between PC5-S DCR message and PC5-RRC RRCReconfigurationSidelink messages. |
| NEC | 2 | Prefer to align with DCR message. |
| InterDigital | 1 | It would be preferrable to avoid latency, and therefore not apply DRX to communication during the setup of the unicast link. |
| Huawei, HiSilicon | 1 | From RX UE perspective, DRX is deactivated after receiving DCR message and activated when receiving the first RRCReconfigurationSidelink message (incl. DRX configuration). From TX UE perspective, DRX is deactivated after sending DCR message and activated when sending the first RRCReconfigurationSidelink message (incl. DRX configuration). |
| CATT | 1 | For the following message after PC5-S DCR message, DRX will introduce the delay to UC link establishment. |
| vivo | Option 2 with comments | In order to harvest the power saving gain, it is better to keep using default SL DRX configuration. However, at lease, the inactivity timer should be applied. For instance, the Tx-UE can start the inactivity timer and try to receive the SMC so as to reduce the time of UC establishment. |
| Samsung | Option 1 |  |
| Nokia | Option 1 | We prefer to have no DRX before DRX is configured |
| Apple | Option 2 | The obvious problem with Option 1 is that “DRX not applied” is an ugly exception to be introduced in SL DRX scheme. How long a UE shall stay in this exception state to halt all SL-DRX operation if the PC5-S procedure goes wrong? To algin with SL-CSI reporting case, we think the correct way is to configure a "link setup period” as added ACTIVE time for the UE receiving DCR. |
| Qualcomm | Option 1 | Both Rel 16 & Rel 17 UEs may detect DCR from a Tx UE using default SL DRX for BC/GC, but the Rel 16 UE’s response for DCR (i.e., DCA message) may be transmitted out of the active time of the default SL DRX. |
| Lenovo | 1 | Prefer to avoid latency and consider the DRX gain is marginal |

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. |
| LG | No | No | No | Same view with Xiaomi. |
| NEC | included | included | included | Whether to indicate RX UE’s desired value is up to RX UE’s implementation. |
| InterDigital | No | No | No | These times are related only to the data transmission properties and not related to alignment with other DRX configurations at the RX UE, so we think the TX can decide them alone. |
| Huawei, HiSilicon | No | No | No | Agree with Xiaomi |
| CATT | Yes | Yes | Yes | These timer information could give more information to TX UE to determine the DRX configuration, which is also helpful for the alignment of SL DRX and Uu DRX. |
| vivo | No | No | No | Share similar view as Xiaomi. |
| Samsung | No | No | No |  |
| Nokia | No | No | No | If we allow to include these, there will also be a certain assumption from the Rx UE that these may be followed. If this information will never be used, there is no reason in transmitting it. |
| ASUSTeK | No | No | No | On-duration timer and DRX cycle are information more related to Rx UE and should be provided, while HARQ RTT timer and re-transmission timer are more related to Tx UE. |
| Apple | Yes | No | No | Share the same view as ZTE |
| Qualcomm | Yes w. comment | No | No | Sharing the value of inactivity timer may help to synchronize the active duration extended by the inactivity timer between Tx UE and Rx UE.  No strong view on sharing the RTT timer value and/or HARQ retransmission timer value – not supporting is OK to simplify the design. |
| Lenovo | No | No | No | These parameters are related to traffic characteristics, which does not known by Rx UE. Even if Rx UE include such parameters into assistance information, Tx UE will not consider them. |

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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.** |
| LG | Single value | TX UE determines the final SL DRX configuration for RX UE, and there exists a procedure that the RX UE transmits the accept/reject messages to the TX UE about the SL DRX configuration determined by TX UE. It is unclear how much the RX UE can get gains when the RX UE transmits multiple desired SL DRX values to TX UE compared that when the RX UE transmits a single desired SL DRX value to TX UE.  It can reduce the complexity if RX UE transmits only one desired SL DRX value, which represents RX UE’s desired SL DRX among multiple SL DRX values. And the TX UE can decide the SL DRX configuration for RX UE considering the received one desired SL DRX value from RX UE. For RX UE to transmit a single SL DRX value to TX UE can reduce unnecessary complexity. |
| NEC | Single value | Single value is helpful to reduce signalling overhead. Moreover, the performance gain of multiple values is unclear. |
| InterDigital | Multiple values | This provides more flexibility to the TX UE to select a DRX configuration that is acceptable to the RX UE. |
| CATT | Multiple values | **More information could be provided to Tx UE to make the decision on DRX configuration.** |
| **vivo** | Single-value | For each DRX setting (cycle, timer and etc.), a single value is enough. We don’t see obvious benefit by multiple values per DRX setting compared with the signalling overhead. Even with a single value, the TX UE has the flexibility / freedom to decide SL DRX configuration. |
| Samsung | Multiple values |  |
| Nokia | Single value, but can follow majority | We do see the advantage of multiple values, but it will also create some ambiguity on what is preferred and what is last resort. In that sense, having a single value makes it easier for the Tx UE to decide |
| ASUSTeK | Single value | The scenario where an Rx UE has multiple preferences for DRX configuration is unclear. |
| Huawei, HiSilicon | Single value | We don't see much benefit to support multiple values. With single value approach, the optimal SL DRX configuration for RX UE can be achieved through iterations between TX UE’s reconfiguration of SL DRX configuration and RX UE’s rejection. Most probably, in our view, this approach would be more effective than to ask TX UE to figure out optimal SL DRX configuration based on multiple value input from RX UE as TX UE would have no idea which one of the multiple value is optimal value for RX UE. |
| Apple | Multiple values |  |
| Qualcomm | Multiple values | Multiple values if available, which may be beneficial for Tx UE to make a decision on SL DRX configuration for Rx UE. |
| Lenovo | Multiple values | Multiple values provide more flexibility for Tx UE/gNB to determine the suitable SL DRX configuration, and is naturally since there exists multiple value cases e.g. Uu DRX parameter, multiple SL DRX parameters etc. For single value, Rx UE needs to derive the single value from multiple values which depends on Rx UE implementation, which does not help to determine the final suitable SL DRX configuration. |

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.  [OPPO] fail to understand what is the diff between mandatory or not – if both ends up with Rx-UE may or may not send out assistance information.. Anyway, we do not take a strong view here, but just expect a reasonable logic – our response above were for the case where assistance information is to be sent. |
| 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** |
| LG | None of them | (RAN2 116e agreement) *“When TX UE doesn’t receive any assistance information from RX UE, TX UE considers that RX UE is ok with any DRX configuration (including no DRX configuration)”.*  According to the above agreement in RAN2, for RX UE not to deliver assistance information to TX UE means that the RX UE is ok any SL DRX including no DRX. This agreement includes that it is not mandatory that RX UE always transmits assistance information to TX UE to receive SL DRX configuration from TX UE. Considering this situation, if the condition-1/2 is accepted, the assistance information should be include an indication to indication any SL DRX or no SL DRX. So, it’s hard to agree the condition-1/2 itself as long as to modify the current agreement.  In the aspect of respecting the current agreement, we suggest a new timer. For example, the new timer starts after capability exchange between TX and RX UE. If TX UE does not receive any assistance information from RX UE until the new timer expired, it implies that RX UE indicates that the RX UE could accept any SL DRX or no SL DRX form TX UE. This method does not need to indicate in assistance information whether any/no SL DRX is acceptable. |
| NEC | 1 and 2 | The two sound reasonable. |
| InterDigital | 1 and 2 |  |
| Huawei, HiSilicon | 1 and 2 with comments | 1 is straightforward.  For 2, we share the understanding of Xiaomi. However we need to allow the initial transmission. We suggest to update Condition-2 as “the assistance information has not been sent previously, if RX UE is interested to send assistance information” |
| CATT | Condition 1 | Condition 1 is enough. |
| vivo | 1, 2 | We can also accept to leave it to UE implementation |
| Samsung | 1 and 2 | For 2, we share the understanding of Xiaomi. However we need to allow the initial transmission. |
| Nokia | Condition 1, if any |  |
| ASUSTeK | 1 and 2 |  |
| Apple | 1 and 2 | Also agree with Xiaomi and Huawei |
| Qualcomm | Comment | Rx UE may decide to send assistance info or not for both condition 1 and 2, e.g., the Ex UE hasn’t established any PC5 RRC connection with other UEs yet and thus has no preference for SL DRX configuration. |
| Lenovo | 1 and 2 | 1 is straightforward and 2 is critical for the initial case. |

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 views  Moderator 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 message  For 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.** |
| **LG** | **Yes** | The timer starting after capability exchange is for TX UE to decide whether assistance information from RX UE exists or not. If TX UE does not receive assistance information from RX UE within the time, the TX UE decides that any SL DRX (including no SL DRX) can be configured for RX UE. Or, if TX UE receives assistance information from RX UE within the time, TX UE will configure SL DRX considering the received assistance information from RX UE.  So, the timer is needed for deciding whether assistance information from RX UE exists or not. It will be helpful to reduce unnecessary negotiation for SL DRX configuration. |
| NEC | No need to define such a time restriction | Tx UE can send DRX related configuration to RX UE without waiting for Rx UE assistance information. |
| InterDigital | No | We can leave this upto TX/RX UE implementation – no need to overspecify. |
| Huawei, HiSilicon | No | It's up to TX UE’s implementation or TX UE’s serving gNB’s implementation. |
| CATT | No | It is considered as UE implementation. |
| vivo | No | We prefer not to restrict the TX-UE behaviour on when to initialize the SL DRX configuration. Both are possible and allowed, i.e., behaviour 1) Tx does not wait for Rx assistance to signal a DRX configuration to the Rx UE. and behaviour 2) TX UE waits for assistance information from RX UE for a certain period before signalling a DRX configuration to the Rx UE. Therefore, no need to specify a time period and leave it to TX-UE implementation. |
| Samsung | No |  |
| Nokia | No | But we agree with ZTE that there should be a description of the procedure for receiving assistance information. |
| ASUSTeK | No | Should be up to UE implementation. |
| Apple | No | As long as RX UE can reject the configuration sent by TX UE, TX UE can decide wait for RX assistance information or not. |
| Qualcomm | No | It’s up to Tx UE’s implementation. |
| Lenovo | No | Up to UE/gNB implementation is enough |

**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 RRC running-CR discussion)**

|  |  |  |
| --- | --- | --- |
| **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.** |
| LG | No | It’s ok to be notified via ‘NOTE’, but a further description is not needed in spec. We think it is enough to be described on the RX UE side. |
| NEC | No strong view | Anyway how to take assistance information into account is up to Tx UE implementation. |
| InterDigital | Agree | This would be beneficial, since it is the purpose of the assistance information. |
| Huawei, HiSilicon | No | It is not clear to us why it should be captured in MAC spec. It’s more like RRC spec scope. Additionally it doesn’t make much sense to further restrict a behaviour that is “based on its implementation” to begin with.  So we think at most a note is enough.  [OPPO] Sorry for the typo, it should be RRC spec. |
| CATT | Agree | It is natural option for Tx-UE to take it into account for DRX configuration. |
| Vivo | Agree | We are ok to discuss it in the Stage 3 running CR. |
| Samsung | No (see comment) | It’s ok to include it via NOTE since it is not mandated for TX UE and final decision is up to UE implementation. |
| ASUSTeK | Agree |  |
| Apple | Agree |  |
| Qualcomm | Comment | No need for normative text. If majority companies support it, a NOTE is OK. |
| Lenovo | Agree | It is naturally to consider assistance information from Rx UE and Tx UE should consider the information, otherwise why we define the assistance information |

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.** |
| LG | Option 2 with comment | The desired SL DRX of RX UE could be changed after transmitting to TX UE. In this case, the RX UE can send a reject message even though the SL DRX configuration from TX UE is matched the previously sent desired SL DRX value from RX UE. Because the current changed desired SL DRX value in RX UE may not be matched the received SL DRX configuration from TX UE.  So, we suggest modifying the sentence of option-2 as follows.  **“For example, RX UE can send a reject message to TX UE when the RX UE receives SL DRX configuration unable to comply (regardless of whether the received SL DRX does not match with the transmitted desired SL DRX from RX UE or not). “** |
| NEC | Option 1 | It is up to RX UE implementation. |
| InterDigital | Option 2 with comments | We think the spec should capture a condition for rejection, but the condition of matching the suggested configuration is not appropriate – if the configuration would be rejected if it doesn’t follow assistance information, why would the TX UE send such a configuration in the first place.  The spec should capture that the RX UE rejects the configuration if the configuration is not suitable/acceptable at the RX UE. In other words, it may be possible that even if the TX sends a DRX configuration that doesn’t match the assistance information, the RX UE still determines this to be suitable.  For example, “**The RX UE can send a reject message to the TX UE when the RX UE receives a SL DRX configuration that is not suitable for the RX UE. Note: Suitability may be determined by RX UE implementation and may be a function of the overall number of SL resources it needs to monitor while in DRX**”. |
| Huawei, HiSilicon | Option 2 | If only the desired SL DRX configuration is acceptable to RX UE, it should be allowed to reject DRX configuration.  **If we do not specify the condition for RX UE to reject SL DRX configuration, i.e., leave the condition to RX UE implementation, TX UE does not know how to derive a new/proper SL DRX configuration after it receives the reject, which may lead to excessive/inefficient SL DRX reconfigurations.**  **Further, if RX UE can reject SL DRX configuration based on its implementation, it is equivalent to that RX UE can “unconditionally” reject SL DRX configuration. The behaviour of “SL DRX configuration determination mechanism” will deviate from the agreed “TX UE centric” principle.** |
| CATT | Option1 | It is considered as Rx-UE implementation. |
| vivo | 1 with comments | We think the conditions for Rx-UE to reject a SL DRX configuration has already been discussed and agreed to leave it to RX-UE implementation. RX-UE implementation will take into account of all possible conditions e.g., listed in R2-2200483 and we only need to specify the signalling content of the SL DRX reject information. |
| Samsung | Option 1 |  |
| Nokia | Option 1 | The current wording of option 2 is obvious and seems to be up to UE implementation which in the end will lead to option 1. If the intention is to state that option 2 only counts if assistance information has been sent, then we think that anyway the Tx UE should not send the DRX configuration if not matching the assistance information, which does not make any sense either. However, we may report in the rejection a cause value. |
| ASUSTeK | No strong view | If captured, no additional detailed conditions should be added in order to avoid complicated spec design. |
| Apple | Option 2 with comment | The problem with current tOption 2 wording assumes that TX UE always send SL DRX configuration after receiving RX UE assistance information. We agree with LG’s change. |
| Qualcomm | Option 1 | Leave this to Rx UE’s implementation. |
| Lenovo | Option 1 | Up to UE implementation is enough |

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 rejection  Proposal 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*?**

|  |  |  |
| --- | --- | --- |
| **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.** |
| LG | Option-1 | To reduce spec impact, we prefer to use RRCReconfiguartionFailureSidelink message with cause value. If we use RRCReconfigurationCompleteSidelink message for indicating SL DRX rejection, we have to clarify that the RX UE uses the prior SL DRX configuration until receiving a new SL DRX configuration after rejecting the SL DRX configuration such as the issue in Q2.1.1-8. It will occur a spec effort. |
| NEC | 2 | The expected behaviour is to indicate rejection of DRX configuration and accept others within *RRCReconfigurationSidelink*, so *RRCReconfigurationCompleteSidelink* is more efficient. |
| InterDigital | 2 | Same view as OPPO |
| Huawei, HiSilicon | 2 | Rejecting the SL DRX configuration is not due to reconfiguration failure |
| CATT | 1 | If we apply the option-2 and only DRX configuration is included in the *RRCReconfiguration* message, it is strange to give DRX rejection in the *RRCReconfigurationCompleteSidelink* message. |
| vivo | 1 | SL DRX configuration is included as part of the sidelink RRC configuration on top the legacy SL configuration. We think the *RRCReconfigurationCompleteSidelink* should be used only if both SL DRX configuration and the legacy SL configuration are successful. This is following Uu RRC principle as below i.e., RAN2 don’t support partial success via *RRCReconfigurationComplete*. 5.3.5 RRC reconfiguration NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/failure. |
| Samsung | Option 2 |  |
| Nokia | Option 1 | Agree with Vivo |
| ASUSTeK | No strong view |  |
| Apple | Option 1 | In our view “Complete” message has a meaning of success. Using the RRCReconfigurationFailureSidelink seems more appropriate |
| Qualcomm | Option 1 | RRCReconfigurationFailureSidelink is more proper for rejecting a RRC configuration, e.g., failed the configuration because of the rejection. |
| Lenovo | 1 | SL DRX configuration is kind of radio configuration and using failure message is more suitable. And with cause value, Tx UE knows which part of radio configuration is failed |

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

|  |  |  |
| --- | --- | --- |
| **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? |
| LG | agree | RX UE sends RRCReconfigurationFailureSidleink with cause value (e.g., SL DRX reject) and the remaining other configuration (non-DRX configuration) can be adopted. |
| InterDigital | Agree | We see no need for the entire configuration to be rejected only because the DRX configuration is rejected. In this case, a cause value would be needed. |
| CATT | See comment | We are neutral to introduce an indication, but we prefer to consider the DRX configuration rejection as the legacy procedure, that is, all RRC configuration is rejected if DRX configuration is rejected. |
| Vivo | Agree | The indication is used to differentiate the SL DRX configuration failure case from the legacy SL configuration failure case. |
| Nokia | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree | Since SL DRX may be a subset of the RRC configuration, need to differentiate the failure for SL DRX configuration only to avoide reconfigure other non-SL DRX related parameters. |
| Lenovo | Agree |  |

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

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| --- | --- | --- |
| **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 |  |
| LG | Yes, but, | If RRCReconfigurationCompleteSidelink message is adopted, we think an indication for the SL DRX configuration rejection has to be introduced. But, considering the meaning of rejection is that the configuration is not completed, we think it can give some confusion the reject indication is included in the completion message. |
| NEC | Agree |  |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree |  |
| Samsung | Agree |  |

**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 |  |
| LG | yes | It needs spec addition efforts when RX UE sends RRCReconfigurationCompleteSidelink including the reject message, RX UE should use the prior SL DRX configuration except for other non-DRX configurations. If RRCReconfigurationFailureSidelink is adopted, this additional description will not be required in spec. |
| NEC | Agree | Sounds reasonable. |
| InterDigital | Agree |  |
| Huawei, HiSilicon | See comments | It is not clear to us what the prior SL DRX configuration is.  If it is the SL DRX configuration included in the latest *RRCReconfigruationSidelink* message, then our answer is Agree. |
| Samsung | See comments | Agree with Huawei. |

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.** |
| LG | Option 2 | The timer is needed. Otherwise, it’s not clear how long RX UE should follow the unacceptable SL DRX configuration after sending a reject message. If the RX UE does not receive any acceptable SL DRX configuration from TX UE within some specific time even though sending a rejection message, the RX UE should be able to decide whether the connection keeps or not. |
| NEC | 1 | No strong motivation to do it. |
| InterDigital | 1 | This can be left to UE implementation – no need to overspecify. |
| Huawei, HiSilicon | Option 1 | We do not see the necessity. If the TX UE is able to provide SL DRX configuration same as the RX UE desired DRX configuration, we assume TX UE would be willing to do this. It seems not reasonable to restrict the TX UE handling here. |
| **CATT** | **1** | **It is considered as UE implementation.** |
| vivo | 2 | If RAN2 confirms that the SL DRX negotiation procedure between SL TX UE and SL RX UE can be multiple-shot. Then the motivation is valid for such scheme in order to avoid endless negotiation between SL TX UE and SL RX UE. |
| Samsung | Option 1 |  |
| Nokia | Option 1 |  |
| **ASUSTeK** | **1** | Should be UE implementation |
| Apple | 2 | It is good to have a timer so both sides are aligned with the progress of this configuration. Otherwise, TX UE may be surprised by RX UE’s sudden link release |
| Qualcomm | Option 1 | UE implementation |
| Lenovo | 1 | We think no need to restrict Tx UE must send a desired DRX configuration e.g. Tx UE may cannot find such kind of DRX configuration and prefer to disable SL DRX. This can be left to UE implementation |

**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,**

**Option 4: Tx UE not configure SL DRX to Rx UE on the unicast link (e.g., release the prior SL DRX configuration)**

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| --- | --- | --- |
| **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. |
| LG | Option-2 | If this timer is expired, RX UE can perform the unicast link release with TX UE.  In the case of option-1, the operation can be performed only when RX UE has already transmitted desired DRX configuration to TX UE at least once. It is not a mandatory operation for RX UE to provide assistance information to TX UE, so it is not clear if there exists desired DRX configuration in TX UE. |
| vivo | 2,4 | Generally, the timer for SL DRX negotiation will be maintained at both TX UE and RX UE side. And the issue can be handled by either TX UE or RX UE. Thus both Option 2 and 4 are possible. |
| Apple | Option 2, 4. | We do not understand Option 3. We think default DRX is only used in BC/GC. |

# **Summary of clause 2.1.1**

For Q2.1.1-1, all companies agree. For which DRX timer should be applied, moderator understand that is coupled with the conclusion on Q2.1.1-2 (e.g., whether inactivity timer to be used), and thus no need to clarify in this Q already.

**Recommendation 2.1.1-1 [15/15]: The default SL DRX configuration for BC/GC [(including at least DRX cycle, start offset and on-duration timer)] can be used for both BC-based and UC-based DCR message.**

For Q2.1.1-2, no clear majority, the preference of option-1 vs. option-2 is 10 vs. 6, moderator suggest to go for majority preference to conclude this issue.

**Recommendation 2.1.1-2 [10/16]: For messages delivery between PC5-S DCR message and PC5-RRC *RRCReconfigurationSidelink* message including DRX configuration, DRX is not applied**

For Q2.1.1-3a, clear majority is not to include those DRX parameters (11/16, 12/14 and 12/14 for the 3 parameters respectively).

**Recommendation 2.1.1-3a: Not include inactivity timer [11/16], HARQ RTT timer [12/14] or re-transmission timer [12/14] in assistance information from Rx UE to Tx UE.**

For Q2.1.1-3b, no clear majority, the preference of multiple-value is 11/17 (one company selected single value can follow majority). Considering single value can still be supported as a unique case of multiple values, moderator suggest to go for majority preference.

**Recommendation 2.1.1-3b [11/17]: In assistance information from Rx UE to Tx UE, for each DRX setting, can include multiple values (detailed signalling format can be left to RRC running-CR discussion).**

For Q2.1.1-4, there is clear majority on option-1 [14/17] but not for option-2 [9/17]. Opponent of option-2 argued that option-2 is not valid if Rx-UE is not interested in sending assistance-information, yet moderator understand that is the premise of all conditions for sending assistance information. Furthermore, considering the current shape of the running-CR “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.” It is technically not reasonable to add only condition-1, i.e., there would be no condition for Rx-UE to send out the first assistance-information message. So moderator suggest to have both option-1 and option-2, by taking Huawei suggested rewording into account.

**Recommendation 2.1.1-4: The delivery of assistance information can be initiated if peer-UE is capable of sidelink DRX [14/17], the assistance information has not been sent previously [9/17].**

For Q2.1.1-5a, clear majority view is negative [15/17], so no need for a proposal accordingly.

For Q2.1.1-5b, supporting ratio is 11/16, as a compromise way-out, as suggested by some opponent as well, moderator suggest to use a NOTE to conclude this issue.

**Recommendation 2.1.1-5b [11/16]: Add a NOTE that Tx-UE derives the DRX setting by taking assistance information into account (detailed wording left to RRC running-CR discussion).**

For Q2.1.1-6, majority view [12/17] is negative(although moderator share the concern by the ones selecting option-2 that otherwise there seems a risk for Rx-UE to do arbitrary rejection). Yet since it is not clear majority, moderator suggest to have a proposal to confirm it.

**Recommendation 2.1.1-6 [12/17]: No need to capture in spec the condition for Rx-UE to reject a DRX configuration.**

For Q2.1.1-7, other than 2 companies who have no strong view, the voting for option-1 vs. option-2 is 8 vs. 7. Moderator suggest to to conclude this issue online. On the other hand, it is not clear, if *RRCReconfigurationFailureSidelink* is adopted, whether all configuration are to be rejected or just the DRX configuration to be rejected (considering different companies answered Q2.1.1-7a provided different view), this FFS point to be further checked.

**Recommendation 2.1.1-7: RAN2 discuss whether Rx-UE use the message of *RRCReconfigurationCompleteSidelink* [7/15] or *RRCReconfigurationFailureSidelink* [8/15] to reject a DRX configuration. If *RRCReconfigurationFailureSidelink* is used, RAN2 discuss whether all configurations to be rejected or just the DRX configuration to be rejected.**

For Q2.1.1-7a, clear majority support it [8/10]. And for Q2.1.1-7b, all companies answer the question support it [7/7], so moderator suggest to go for the proposal regardless of the conclusion of Q2.1.1-7. Yet since recommendation 2.2.1-7 is for further discussion, the related proposal is marked as for further discussion as well.

**Recommendation 2.1.1-7a/7b [15/17]: Regardless of whether message of *RRCReconfigurationCompleteSidelink* or *RRCReconfigurationFailureSidelink* to be used introduce an indication in the message for the DRX configuration rejection.**

For Q2.1.1-8, 6/9 companies support, and there are another 2 companies suggest some rewording of the proposal, which moderator tend to agree, so the ratio is marked as [8/9]. But there seems still a left issue that what if the concerned ***RRCReconfigurationSidelink*** message is the very first one, so a FFS point is added.

**Recommendation 2.1.1-8 [8/9]: After rejecting the DRX configuration, Rx-UE uses the prior SL DRX configuration (included in the latest *RRCReconfigurationSidelink* message which has been accepted by Rx UE) until receiving a new SL DRX configuration. RAN2 further discuss the case where there was no previous *RRCReconfigurationSidelink* message which included DRX configuration accepted by Rx UE.**

For Q2.1.1-9a/b, clear majority is negative [12/17], so no need for a proposal.

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| **Company** | **Recommendation Number** | **Comment** |
| Apple | **2.1.1-2** | We are kind of supporting the idea that a UE remaining DRX active after receiving DCR, but do not understand the term “DRX not applied” in Option 1. For a R17 UE support DRX, it follows the default SL DRX configuration before receiving DCR as 2.1.1-1. After receiving DCR, how DRX is suddenly not applied? Does it mean DRX operation has been suspended for all the SL addresses? Then how long it shall be suspended and on what condition UE can resume the default SL DRX config? It seems some more discussion is needed.  I suggest to change the proposal to “**For messages delivery between PC5-S DCR message and PC5-RRC *RRCReconfigurationSidelink* message including DRX configuration, UEs sending /receiving DCR message should both remain active. FFS how to specify this requirement.**  [Rapp] thanks for the comment – while I do not see ambiguity here:  The operation is similar to Uu, where DRX is not applied during the initial connection setup procedure when UEs are exchanging RRC signalling. Yet before that, there is some DRX-like mechanism (e.g. paging cycle for UE, and RACH pattern for network). There seems no need to talk about the so-called “DRX suspension” operation, i.e., the Tx/Rx enters into non-DRX configuration status upon the transmission/reception of DCR message.  Logically, one can ask “how to do specification” for every stage-2 issue, so there seems no need to change for that either. |
| Ericsson | 2.2.1-4  2.1.1-8-1 and 2.1.1-8-2 | **In the recommendation, “and RX UE is interested to send assistance information” is not clear, how to define “RX UE is interested”? RAN2 has already agreed that it is up to RX UE implementation to determine when to send assistance information. We are fine to include both options in the recommendation for further discussion. However, we suggest to remove “and RX UE is interested to send assistance information”**  **[Rapp] Ok, especially considering 2.2.1-4 says it “can be initiated if xxx”, i.e., it does not to force Rx-UE must send it if both conditions hold.**  Perhaps it is sufficient to merger 2.1.1-8-1 and 2.1.1-8-2 as one recommendation. i.e., UE applies previous one if there is any, otherwise FFS  [Rapp] OK. |
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# 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?**

|  |  |  |
| --- | --- | --- |
| **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** |  |
| LG | Yes, but with comment | The following question Q2.1.2-1b can be decided depending on whether this question is for RRC\_CONNECTED UE. Because, if we assume that the UE is RRC\_CONNECTED, the SL-DRX capability doesn’t need to have SIB dependency.  Anyway, we agree SL and SL-DRX capability should be differentiated. |
| NEC | Yes |  |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Yes | There may be gNBs of different releases. |
| **CATT** | **Yes** |  |
| **vivo** | **Yes** |  |
| Samsung | Agree |  |
| Nokia | Yes |  |
| **ASUSTeK** | **Yes** |  |
| Apple | Yes |  |
| Qualcomm | Yes |  |
| Lenovo | 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**

|  |  |  |
| --- | --- | --- |
| **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** |
| LG | Option 2 | We have the same view as Xiaomi. |
| NEC | 2 | Less signalling overhead and spec impact. |
| InterDigital | Option 2 | Agree with Xiaomi |
| Huawei, HiSilicon | Option 2 | SL DRX configuration in SIB12 is sufficient. |
| CATT | Option 2 | The SL DRX configuration for BC/GC in SIB12 is used as implicit indication. |
| **vivo** | **1 or 3** | For companies who prefer option 2, they think the presence of DRX configuration for GC/BC in SIB2 can indicate the gNB’s support of SL DRX.However, we share different view.  Firstly, the SL DRX related configuration i.e., *sl-DRX-ConfigCommon-GC-BC* is optional present. For the case that the field *sl-DRX-ConfigCommon-GC-BC* is not configured, the UE cannot know whether the serving gNB is SL-DRX capable or not. Furthermore, we think the case that the sl-DRX-ConfigCommon-GC-BC is not configured while the gNB is still SL DRX capable is valid because the gNB may want to configure the UE with dedicated SL DRX configuration for all cast types. Based on above observations, Option 2 is not a feasible solution. And we suggest to adopt Option 1 or 3 instead. For the signaling design of dedicated RRC or *SIB12*, both are acceptable to us. Although we slightly prefer Option 1 given that the gNB’ support of SL DRX is more suitable to be per-cell signaling granularity. But considering that the UE will anyway enter RRC\_CONNECTED first and then report SUI afterwards. The per-UE signaling by Option 3 is also reasonable to some extent. |
| Samsung | Option 2 |  |
| Nokia | Option 2 |  |
| ASUSTeK | 2 |  |
| Apple | 2 |  |
| Qualcomm | Option 2 | A gNB supporting SL DRX will have QoS based SL DRX parameters for BC/GC in SIB12. |
| Lenovo | Option 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.

|  |  |  |  |
| --- | --- | --- | --- |
| **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 only  Report 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?**

|  |  |  |
| --- | --- | --- |
| **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** |  |
| LG | Yes |  |
| NEC | Agree | For mode-2, it is not necessary to report assistance information to gNB. |
| InterDigital | Agree | This is a natural consequence of what we agreed for mode 2 DRX configuration of connected UE. |
| Huawei, HiSilicon | Agree |  |
| CATT | Agree | The reason is Tx UE in mode-2 will determine the DRX configuration by itself. |
| vivo | Agree |  |
| Samsung | Agree |  |
| Nokia | Yes |  |
| ASUSTeK | Agree |  |
| Apple | Yes |  |
| Qualcomm | Yes |  |
| Lenovo | Yes |  |

**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?**

|  |  |  |
| --- | --- | --- |
| **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.** |
| LG | Yes |  |
| NEC | Agree | Similar to the previous question, it is not necessary for mode-2. For mode-1, it might be helpful to let gNB adjust Uu DRX to find out an acceptable SL DRX configuration. |
| InterDigital | Agree |  |
| Huawei, HiSilicon | ~~Agree~~  Revised to “Not support reporting reject info. in both Mode 1 and Mode 2” | If TX UE only reports assistance information to gNB in mode 1 then it shall, based on the same principle, only report reject information in mode 1 as the reject information can be considered as kind of “assistance information”.  Revision: from gNB perspective, gNB would able to understand the rejection implicitly based on received new desired SL DRX configuration as RX UE may update its desired SL DRX configuration.  The question is slightly confusing as it can be interpreted as “would you support reporting reject info in Mode 1” or “would you support reporting reject info only in Mode 1 if the reporting is supported”.  Comparing the significance of the benefits brought by the reject info reporting and the extra signaling needed, we prefer not to have this reporting for both Mode 1 and Mode 2. |
| CATT | Agree | It is helpful to let gNB know the SL DRX configuration is acceptable or not . |
| vivo | Yes | For mode 1, the TX-UE reporting DRX configuration reject information is necessary as it’s the TX-UE’s serving gNB who decides the SL DRX configuration. However, for mode 2, we don’t see the necessity because the TX-UE will trigger SL DRX negotiation with RX-UE once receiving the SL DRX configuration reject information from the RX-UE. |
| Samsung | Agree |  |
| Nokia | Agree |  |
| ASUSTeK | Agree |  |
| Apple | Agree with comments | But we also agree with Huawei if we assume RX UE will send new assistance information anyway, then TX UE can skip this reporting and just report new assistance information. |
| Qualcomm | Yes, agree |  |
| Lenovo | Agree | Since in mode 1, gNB determine the SL DRX configuration, it is necessary to report reject information to gNB |

**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.** |
| LG | Yes, but please, See comment | In mode-2, TX UE reports SL DRX configuration that is configured by TX UE and accepted by RX UE. The reported SL DRX configuration can be used for alignment between Uu DRX and SL DRX of RX UE.  And also, when mode transition happens from mode 2 to mode 1, the TX UE needs to report the current used SL DRX configuration to the gNB. The reported SL DRX configuration from TX UE can be helpful to configure Uu DRX by gNB. So, in the case of mode transition from mode 2 to mode 1, mode 1 TX UE can report the current used SL DRX configuration to the gNB. |
| NEC | Disagree | Same view with Xiaomi and ZTE. |
| InterDigital | Disagree | In mode 2, alignment between Uu DRX and SL DRX may not be as critical since the TX UE does not receive SL scheduling. |
| Huawei, HiSilicon | Disagree | No need for TX UE’s gNB to know the SL DRX configuration in case of Mode-2. |
| CATT | Disagree | The Tx UE in mode-2 will determine the DRX configuration by itself, so it is not necessary to report DRX configuration to gNB. |
| vivo | Disagree |  |
| Samsung | Disagree |  |
| Nokia | no |  |
| ASUSTeK | Disagree | No need for gNB to know |
| Apple | Disagree |  |
| Qualcomm | No, disagree |  |
| Lenovo | Disagree | We do not see a strong need to report this in mode 2, consider Tx UE perform the resource selection |

**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?**

|  |  |  |
| --- | --- | --- |
| **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** |  |
| NEC | Agree | If gNB is not capable of SL DRX, it is not necessary to send SL-DRX related report to gNB. |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree |  |
| CATT | Agree |  |
| vivo | Agree |  |
| Samsung | Agree |  |
| Nokia | Agree |  |
| ASUSTeK | Agree |  |
| Appple | Agree |  |
| Qualcomm | Agree |  |
| Lenovo | 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 |
| LG | yes | When mode 1 TX UE is connected with gNB having no SL DRX capability, the TX UE decides SL DRX for RX UE by itself (as for mode -2). There is no way. The controllability for deciding SL DRX is depending on the SL DRX capability of gNB. In other words, if the serving gNB of TX UE doesn’t have SL DRX capability, the controllability for deciding SL DRX for RX UE exists on TX UE even the TX UE is in mode 1. |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Disagree | Agree with Xiaomi. TX UE would know, through SIB12, that its gNB is not SL DRX capable. It is reasonable TX UE would not to enable SL DRX at least for Mode 1. |
| CATT | Agree | Agree with oppo, in this case, the Tx-UE itself will determine the DRX. In order to avoid the resource wasting by gNB scheduling, the Tx-UE could report the DRX configuration for a destination ID to the gNB. |
| vivo | Disagree | Also confused about the question. If the gNB is not capable of SL-DRX and the UE would like to perform DRX operation, should the UE just transfer to mode-2? Then it can work in mode-2 and no new issue here. |
| Samsung | Disagree (see comments) | If the question is whether TX-UE itself can determine SL DRX for mode2 even when SL-DRX is not supported by the gNB, we think it’s reasonable TX UE would not to enable SL DRX. |
| Nokia | see comments | At least we need to clarify the issues stated by other companies |
| ASUSTeK | Disagree | For mode-2, Tx UE should determine SL DRX for Rx UE; for mode-1, when gNB is not capable of Sl-DRX, the Tx UE does not enable SL DRX for Rx UE. |
| Apple | No | The problem is that if UE remain in mode 1, it cannot get correct resource allocated by gNB to align with RX UE DRX active time. So, UE has to switch to mode 2, but a mode-1 UE may not support mode 2 sensing. So, it cannot do SL-DRX in this case. |
| Qualcomm | Disagree w. comment | No clear if this is for Mode 1 or Mode 2. Assume it’s for Mode 1 when gNB is not capable for SL DRX, e.g., a Rel 16 gNB. In this case, where the Tx UE decides an SL DRX configuration, how can a rel 16 gNB understand the SL DRX configuration and support it for Mode 1 resource allocation? In this case the sidleink is operated as Mode 2. |
| Lenovo | Disagree | Agree with Xiaomi, at least for mode 1 which relies on gNB scheduling, SL DRX should not be enabled. |

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** |
| LG | All (1,2,3,4,5,6) | In the case of unicast, because all the parameters are decided by TX UE or the serving gNB of TX UE, the serving gNB of RX UE doesn’t know anything. So, RX UE may need to report the received all the SL DRX configurations from TX UE to gNB. RX UE reports all SL DRX configuration to the gNB, and it can be gNB implementation which specific parameters are used or not. |
| NEC | At least 1,2,3, | No strong view on 4,5,6. |
| InterDigital | All | Same view as LG |
| Huawei, HiSilicon | At least 1, 2, 3 | We are open to discuss 4, 5, 6 |
| CATT | 1,2,3,4,5,6 | By this way, the legacy DRX configuration IE could be reused, otherwise, RAN2 needs to design new IE for limited SL DRX parameters. |
| vivo | 1,2,3 | Agree with rapporteur’s comments. |
| Samsung | 1, 2, 3 | Basically it’s similar question as Q2.1.1-3a. It will be good to have same principle for both cases. |
| Nokia | 1, 2, 3 | Fine if reuse of DRX configuration IE is chosen |
| Apple | 1,2,3 |  |
| Qualcomm | 1, 2, 3 |  |
| Lenovo | At least 1, 2, 3 | Do not see the necessity to report 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** |
| **LG** | **All (1,2,3,4,5,6)** | Because all the values are decided by TX UE in mode 2, the TX UE has to report the values to its serving gNB. The values can be used for alignment between Uu DRX and SL DRX of RX UE.  Also, especially all the reported values can be usefully applied when mode transition happens from mode 2 to mode 1. If mode transition happens, the gNB can assign SL resources properly based on the reported information. |
| NEC | None |  |
| vivo | None |  |
| Samsung | None or 1,2,3 (see comments) | Q2.1.2-2c was for mode2 and if the question is related to resource (pool) allocation, we think none. If it is for mode2 and the question is related to Uu and SL DRX alignment, we think 1,2 and 3. |
| ASUSTeK | At least 1,2,3 |  |
| Apple | None | We think this reporting is optional and not critical because there is no need for Uu/SL lignment for mode 2 TX UE. So, we support the majority view to just not require this in specification. |
| Qualcomm | None | gNB not supporting SL DRX (e.g., Rel 16 gNB) may not be able to understand this. |

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.** |
| NEC | Option 4 | Same view with Xiaomi. |
| LG | Option 4 |  |
| InterDigital | 1 | We prefer to downprioritize this discussion, as it seems not so critical to support MAC CE for mode 1. |
| **Huawei, HiSilicon** | **Option 4** | **Tx-UE can determine whether to send SL DRX command MAC CE based on prediction of data arrival. In addition, no need to report SL DRX command MAC CE to gNB for the purpose of enabling NW and UE sync on SL DRX active time. In previous discussion RAN2 concluded not to specify how to ensure sync on active time between NW and UE. Further, agree with Xiaomi, SL DRX command MAC CE is used when there is no SL data predicted.** |
| CATT | Option 4 | It is considered as UE implementation. |
| vivo | 4 | RAN2#115e made the following agreement. Even for mode 1, we can leave it to UE implementation as illustrated by Xiaomi above.  2: When TX UE sends SL DRX MAC CE is up to UE implementation. |
| Samsung | Option 1 | Prefer simple solution. With option 4, the UE and gNB may still have mismatch on SL DRX active time. We understand RAN2 decided not to specify mismatch case due to SL DRX in-activity timer, but at the same time we don’t want to introduce more mismatch case due to SL DRX command MAC CE. With allowing more and more mismatch cases, mode 1 may not really work in SL DRX. |
| Nokia | Option 4 |  |
| ASUSTeK | Option 1 |  |
| Apple | Option 1 or 2 | We share the view as OPPO because Option 4 is against mode 1 principle to follow NW instruction. |
| Qualcomm | Option 4 | Up to Tx UE’s implementation. From Rx UE’s perspective, no difference between Mode 1 and Mode 2. |
| **Lenovo** | Option 1 | We think there has no critical issue not support SL DRX CMD in mode 1. It is an optimization to support SL DRX CMD in mode 1 and could be de-prioritized |

# **Summary of clause 2.1.2**

For Q2.1.1-1a, all companies agree.

**Recommendation 2.1.2-1a [17/17]: RAN2 needs to handle different scenarios where gNB supports or not supports SL DRX.**

For Q2.1.1-1b, clear majority view [16/17] is option-2.

**Recommendation 2.1.2-1b [16/17]: gNB notify supporting SL-DRX based on the presence of SL-DRX configuration for GC/BC in SIB12.**

For Q2.1.2-2a, all companies agree.

**Recommendation 2.1.2-2a [17/17]: For gNB supporting SL-DRX, Tx-UE report assistance information only in mode-1.**

For Q2.1.2-2b, clear majority view [16/18] is to support rejection-info report (including one company who tend to agree with Huawei that this information should be available based on updated assistance information).

**Recommendation 2.1.2-2b [16/18]: For gNBsupporting SL-DRX, Tx-UE report DRX configuration reject information only in mode-1.**

For Q2.1.2-2c, clear majority view [16/18] is negative, so no need for a proposal accordingly.

For Q2.1.2-2d, all companies agree.

**Recommendation 2.1.2-2d [16/16]: For gNB not supporting SL-DRX, Tx-UE does not report assistance information or DRX configuration reject information, and Rx-UE does not report DRX configuration information for UC or QoS information for GC/BC.**

For Q2.1.2-2e, clear majority view [11/15] is negative, yet the argument on how to handle such case is a bit diverse: some believe no SL-DRX should be used (in such case, considering we did not conclude on a solution if Tx-UE keep ignoring the assistance information by Rx-UE, moderator wonder whether it ends up with Rx-UE’s assistance information being simply ignored), while others believe the UE should work in mode-2 (in such case, moderator wonder how to prevent a gNB incapable of SL-DRX to put the UE into mode-1?). So seems some further discussion is needed in this case.

**Recommendation 2.1.2-2e [?/15]: RAN2 further discuss how to handle the SL-DRX configuration if gNB is incapable of SL-DRX while the Tx-UE is in mode-1.**

For Q2.1.2-3a, all companies agree on parameter 1/2/3.

**Recommendation 2.1.2-3a [16/16]: For DRX configuration report by Rx-UE, Include DRX parameter(s) of 1) SL DRX cycle length, 2) SL DRX start offset, and 3) SL DRX on-duration timer length.**

For Q2.1.2-3b, since Q2.1.2-2c ends up with no conclusion, no need for this either.

For Q2.1.2-4, majority view [10/17] (59%, not clear majority) is option-4, so moderator suggest to go for majority view.

**Recommendation 2.1.2-4 [10/17]: For Tx-UE in mode-1, SL-DRX command MAC-CE can be used, and RAN2 not pursue further optimization for it.**

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| **Company** | **Recommendation Number** | **Comment** |
| Ericsson | **2.1.2-1a, 1b, 2a, 2b, 2d** | Suggest to reword “capable/incapable” to “support/not support”, in principle, there is no gNB capabilities. |
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# 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**

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| --- | --- | --- |
| **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. |
| LG | Option-3 |  |
| NEC | 3 | We are fine to check with SA2 |
| InterDigital | 2 or 3 | Once the L2 ID is passed down to the AS layer, it is associated with a single TX profile. So we don’t think this one to many association is possible at a given time. However, we are fine to as SA2. |
| Huawei, HiSilicon | 2 | According to below clauses from TS 23.287, SA2 already defined that the (singular) NR TX profile is passed to AS together with destination L2 ID. It is quite clear to us that, for each destination L2 ID, only one TX profile will be passed to AS, and it should be up to upper layer to ensure all services associating with a same destination L2 ID will have same TX profile.  1. The V2X layer of receiving UE(s) determines the following for the broadcast mode communication reception:  - the destination Layer-2 ID for broadcast reception as specified in clause 5.6.1.2;  - the PC5 QoS parameters for this broadcast V2X service as specified in clause 5.4.1.1; and  - the NR Tx Profile based on the configuration as specified in clause 5.1.2.1.  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 AS layer of receiving UE(s) determines the PC5 DRX parameter values as specified in clause 5.9.  2. The transmitting UE V2X application layer provides data unit and may provide V2X Application Requirements specified in clause 5.4.1.2 to V2X layer.  3. The V2X layer of transmitting UE determines the following for the broadcast mode communication transmission:  - the destination Layer-2 ID for broadcast as specified in clause 5.6.1.2;  - the PC5 QoS parameters for this broadcast V2X service as specified in clauses 5.4.1.1 and 5.4.1.2; and  - the NR Tx Profile based on the configuration as specified in clause 5.1.2.1.  The transmitting UE self-assigns the source Layer-2 ID as specified in clause 5.6.1.1.  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.  The AS layer of transmitting UE determines the PC5 DRX parameter values as specified in clause 5.9.  4. The transmitting UE sends the V2X service data using the source Layer-2 ID and the destination Layer-2 ID. |
| **CATT** |  | We are fine to check by SA2. |
| **vivo** | **3** | For groupcast and broadcast services, there may be some common understanding between TX UE(s) and RX UEs about L2 ID association with TX profile(s). We can ask SA2. |
| Samsung | Option 2/3 | We can ask SA2 this situation not to happen unless it is really required feature. |
| Nokia | 3 |  |
| Apple | 3 | Check with SA2 |
| Qualcomm | 3 | Wait for SA2 on TxProfile design: if both DRX-based Tx profile and non-DRX based Tx profile are supported in Rel 17. |
| Lenovo | 3 | Suggest to ask SA2 since this is totally SA2 issue |

**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.**

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| --- | --- | --- |
| **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. |
| LG | disagree | In this case, we think the RX UE will adopt an always-on operation. Because the RX UE already knows that the L2 ID is associated with both DRX-based TX profile and non-DRX based TX profile. And also, this reason may be that the packet applied non-DRX based TX profile has a possibility with latency issues.  So, if the same L2 ID is associated with both DRX-based Tx profile and non-DRX based Tx profile, the TX UE may assume the RX UE is an always-on state. |
| CATT | Disagree | We needs to ask SA2 to confirm this case. |
| **vivo** | **Disagree** | **From the perspective of QoS requirement, especially PDB, in the case of a same L2 ID associating with both DRX-based Tx profile and non-DRX based TX profile, a non-DRX operation, i.e. always active, is needed.** |
| Qualcomm | Disagree | SL DRX is enabled per an L2 destination ID, i.e., per a groupcast or broadcast. If one service type doesn’t support SL DRX, the SL DRX cannot be applied to it. |

Left issue on Tx profile report

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| **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**

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| **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** |  |
| LG | Option 1 | In LTE, eNB did not give signalings to the AS layer of UE about the mapping configuration between service type and Tx profile. We think the LET solution can be inherited. |
| NEC | 1 |  |
| InterDigital | 1 |  |
| Huawei, HiSilicon | 2 | Option1 will NOT work in NR SL.  In LTE, only broadcast is supported. In NR, with groupcast, how to ensure the gNB know the TX profile associated with groupcast destination L2 ID where the groupcast destination L2 ID can only be determined when the group is established? |
| CATT | 2 | Option 2 is more flexible considering the service for Destination L2 ID is variable. |
| vivo | 1 |  |
| Samsung | Option 1 |  |
| Nokia | 1 |  |
| Apple | 1 |  |
| Qualcomm | 1 |  |
| Lenovo | 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**

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| **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. |
| LG | Both |  |
| NEC | At least 2 | Not sure about whether 1 is necessary or not. |
| InterDigital | Both |  |
| Huawei, HiSilicon | 2 | **Firstly, we agree with Ericsson that RAN2 has already agreed that TX profile identifies feature, or feature group in RAN2#116, which has excluded that using TX profile to identify Release.**  **Secondly, as RRC CR rapporteur, we failed to recall the EN in RRC running CR is due to the ambiguity of whether or not Tx Profile identifies releases. It is quite clear to us that R17 Tx profile is used to identify features or feature groups before and after said EN. The spare values of *SL-TxProfile-r17* are supposedly used for other features/feature groups if any, but not for releases.** |
| CATT | 1 and 2 | Agree with Xiaomi, both are needed based on the LTE rule and agreement. |
| **vivo** | **2** | **We are not sure whether 1 is needed or not.** |
| Samsung | 2 | We agree with Ericsson and Huawei. |
| Nokia | At least 2 |  |
| Apple | 1 and 2 |  |
| Qualcomm | 2 |  |
| Lenovo | Both |  |

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?**

|  |  |  |
| --- | --- | --- |
| **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** |
| LG | Closed topic | RAN2 made the following agreement in the previous meeting (RAN2 116bis-e meeting)  (agreement) “Tx UE should select a destination associated with an Rx UE that is in SL active time for the SL transmission occasion in SL LCP.”  So, we think its closed topic. No further decision needed. |
| InterDigital | See comment | Agree with LG, this topic is close already. |
| Huawei, HiSilicon | Comments | Agree with LG, there is no need to further discuss using TX profile in SL LCP. |
| CATT | Comment | Agree with Xiaomi. |
| **Vivo** | **Comments** | **Agree with LG.** |
| Samsung | See comment | Agree with LG. |
| Nokia | Comment | Agree with Xiaomi |
| ASUSTeK | Comment | Agree with LG. |
| Apple |  | Same view as LG |
| Qualcomm | Comment | Same view as LG |
| Lenovo | Comments | Agree with LG |

**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**

|  |  |  |
| --- | --- | --- |
| **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.** |
| LG | Option 1 | According to the previous agreement (see the answer in Q2.2-4a), LCP operation performs for the destination that is in SL active time for the SL transmission occasion regardless of always-on or SL-DRX on. |
| InterdDigital | Option 1 | TX profile is associated with L2 ID. |
| Huawei, HiSilicon | 1 | All LCHs for a same destination will have same TX profile, and the SL LCP can be performed based on previous RAN2 agreements, i.e. the answer in Q2.2.-4a. |
| CATT | Option 1 |  |
| **vivo** | **Option 1** | All LCHs for a same destination have same TX profile, and SL LCP can be performed based on active time as the previous RAN2 agreements. |
| Samsung | Option 1 |  |
| Nokia | Option 2 |  |
| ASUSTeK | Option 1 |  |
| Apple | Depending on SA2 clarificaiton on Q2.2-1a |  |
| Qualcomm | Waiting for SA2 | Wait for Sa2’s decision If both DRX-based Tx profile and non-DRX based Tx profile are supported for Rel 17. |
| Lenovo | 1 | Tx profile is per L2 ID. Within the same L2 ID, we think Tx profile is same |

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?**

|  |  |  |
| --- | --- | --- |
| **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. |
| LG | CR issue | We think that RRC CR rapporteur can handle this issue. |
| InterDigital | Disagree | We prefer to downprioritize signaling optimizations at this stage. |
| Huawei, HiSilicon | Agree | It is efficient using an index instead of configuring a QoS profile twice.  If a QoS profile is not configured in RB configuration, R16 QoS profile IE can be reused.  Regarding comments about the late stage, we think signalling efficiency issue can be solved at current stage. As RRC CR rapporteur, we can handle the implementation and companies can comment as in usual running CR review. |
| CATT | Disagree | No strong view, follow the majority view. |
| vivo | disagree | It is a signalling optimization issue. |
| Samsung | Agree (or CR issue) | Why all QoS profile information should be duplicated for RB and SL DRX? We also agree that it is ASN.1 details which RRC CR rapporteur can handle. |
| Nokia | No strong view |  |
| ASUSTeK | No strong view |  |
| Apple | Left to CR discussion |  |
| Qualcomm | Disagree w. comment | Seems further optimization for signaling. May leave it to RRC CR discussion. |
| Lenovo | Disagree | Seems an optimization, but no strong view |

# **Summary of clause 2.2**

For Q2.2-1a, clear majority view [13/17] is to check with SA2.

**Recommendation 2.2-1a [13/17]: Check with SA2 whether a same L2 ID may associate with multiple Tx profiles, and thus may associate with both DRX-based Tx profile and non-DRX based Tx profile.**

So Q2.2-1b is pending SA2 reply.

For Q2.2-2, clear majority [14/16] view is to align with LTE.

**Recommendation 2.2-2 [14/16]: As in LTE, the mapping from Destination L2 ID to Tx Profile is configured in the gNB, i.e., no need for UE to report the mapping.**

For Q2.2-3a, all companies agree with information-2, yet no clear majority on information-1 (support vs. not-support is 8 to 8 + 2 companies answered “at least 2”). Moderator suggest to agree on information-1 and further discuss on information-2.

**Recommendation 2.2-3a: The Tx profile should include at least the information of DRX support or not [16/16], and RAN2 further discuss whether there is a need for release identity [8/16] or not [8/16].**

For Q2.2-4a, there is no majority support or it, either due to the pending issue to be asked to SA2, or considering the existing agreement is sufficient, so no need for proposal accordingly. And similarly for Q2.2-4b so suggest to wait till the reply from SA2 to conclude on this issue.

For Q2.2-5, majority view is negative [12/16], so no need for a proposal.

|  |  |  |
| --- | --- | --- |
| **Company** | **Recommendation Number** | **Comment** |
|  |  |  |
|  |  |  |
|  |  |  |

# 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.

|  |  |  |  |
| --- | --- | --- | --- |
| **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)** |
| NEC | Not started | Agree with OPPO. |
| LG | Not started | Prefer to keep the legacy concept. |
| InterDigital | Not Started | This is a corner case, and we don’t see a major issue with keeping legacy behavior. |
| Huawei, HiSilicon | Started | **The peer UE treated it as NACK and correspondingly consider this RX UE in active time.**  **When RX UE decoded data successfully and an ACK wasn’t transmitted, e.g., due to UL/SL prioritization, TX UE will not receive the PSFCH for this transmission and will send NACK to TX UE’s network according to R16 V2X principle. Meanwhile, TX UE may consider RX UE has started the *sl-drx-RetransmissionTimer* for the SL process corresponding to the unreceived PSFCH. At the RX UE side, if we follow Uu DRX, RX UE will not start the corresponding *sl-drx-RetransmissionTimer*. So the assumed RX UE active time by TX UE and the actual RX UE active time may be not aligned, where RX UE may experience packet loss if** **TX UE’s network schedules the grants for the SL transmission corresponding to other SL processes. To avoid the packet loss in RX UE, *sl-drx-RetransmissionTimer* should be started after expiry of *sl-drx-HARQ-RTT-Timer* when the PSFCH of ACK transmission is dropped.** |
| CATT | Started | Tx UE may perform retransmission or new transmission, in this case, it is better for UE to start *sl-drx-RetransmissionTimer* to receive packet form Tx UE. |
| vivo | Started | Agree with Huawei. TX UE may start the retransmission timer and schedule transmissions. The TX UE and RX UE should be aligned with the same understanding on timer starting. |
| Samsung | Not started |  |
| Nokia | Not started | We would prefer the power saving benefit |
| ASUSTeK | Not started | In Uu, the UE starts retransmission timer if the data is not decoded successfully. To align with Uu behaviour, the Rx UE should not start the timer if the feedback is ACK. |
| Apple | Not started | Corner case. We can go either way, but power saving benefits is more preferred. |
| Qualcomm | Not start | For Rx UE’s power saving |
| Lenovo | Not started | Agree with OPPO |

RTT timer start position if FB-disabled

|  |  |  |  |
| --- | --- | --- | --- |
| **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 |  |
| NEC | Agree |  |
| LG | Comments | I understand that this question is assumed to operate the RTT timer from the time of SCI reception to the next resource if there is a re-tx resource in SCI. Thus, if this question is limited to the case where there is no re-tx resource in SCI, I agree to start the RTT timer based on PSFCH. So I think the condition in case there is no re-tx resource in the question should be added.  [OPPO] I confirm that is the intention. |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Disagree | In case of SL HARQ disable, the UE is not required to determine the PSFCH resource in RAN1 specification. If it was agreed to adopt the above agreement for FB disabled case, RAN1 spec will be impacted. We prefer to resolve the issue in RAN2 instead of causing cross-WG impact. |
| CATT | Agree |  |
| vivo | Agree |  |
| Samsung | Agree |  |
| Nokia | Yes |  |
| ASUSTeK | Agree |  |
| Apple | Agree with comment | We wonder how RX UE determines the “end of PSFCH resource” in FB-disabled case? |
| Qualcomm | Comment | The minimum time gap is for HARQ enabled case. No clear why to limit Rx UE’s reception with RTT timer’s duration. |
| Lenovo | Agree | But open to discuss the issue propose by Huawei |

**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?**

|  |  |  |
| --- | --- | --- |
| **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.** |
| NEC | Disagree |  |
| LG | Disagree |  |
| InterDigital | Disagree |  |
| CATT | Disagree | RTT is stared after the PSSCH. |
| vivo | Disagree |  |
| Samsung | Disagree |  |
| Nokia | Disagree |  |
| ASUSTeK | Disagree |  |
| Huawei, HiSilicon | Agree | It is straightforward to us to start RTT timer at the end of PSFCH in case HARQ enabled.  As to the case where SCI indicating re-tx resource, we have not found any motivation to deviate from the legacy behaviour. Moreover, for simplicity, a unified UE behaviour for transmissions with HARQ feedback enabled is preferred. |
| Apple | NO |  |
| Qualcomm | Disagree | RTT timer may start after the PSSCH with the SCI indicating the retransmissions. |
| Lenovo | Disagree |  |

**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 |  |
| NEC | Agree |  |
| LG | comment | The meaning of "end of PSSCH resource" is ambiguous.  If "end of PSSCH resource" means the end of the currently received PSSCH, we agree the proposal. However, if "end of PSSCH resource" means the last re-tx resource scheduled by SCI, we oppose the proposal. |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree |  |
| CATT | Agree |  |
| vivo | Agree |  |
| Samsung | Agree |  |
| Nokia | Agree |  |
| ASUSTeK | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| Lenovo | Agree |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
| **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 intention  9: 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 correspondingly  9: 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**

|  |  |  |
| --- | --- | --- |
| **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. |
| LG | 2 | I agree with the configuring of the different value of Option 2, but the fixed value of e.g. is not reasonable according to the previous RAN2 agreement.   * *#116-e agreement: “When HARQ feedback is disabled, either zero value or non-zero value can be configured for the HARQ RTT timer if the resource assignment information is not present.”* |
| InterDigital | 2 |  |
| Huawei, HiSilicon | Option 2 | Since there is no HARQ feedback, there seems no need to wait for RTT timer expiry. |
| CATT | 2 |  |
| vivo | 2 |  |
| Samsung | Option 1 | Prefer simple option that can be applied to both cases. Option2 seems an optimization. |
| Nokia | Option 2 |  |
| ASUSTeK | 2 | Agree with LG. |
| Apple | 2 |  |
| Qualcomm | 2 |  |
| Lenovo | 2 |  |

**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 |  |
| NEC | 1 |  |
| LG | 1 |  |
| InterDigital | 2 | Retransmission timer may depend on the PDB and so if HARQ RTT = 0, a longer retransmission timer could be supported compared to the case HARQ RTT is non-zero.  However, we are ok to go with majority view. |
| Huawei, HiSilicon | 1 |  |
| CATT | 1 |  |
| vivo | 2 | How about the case when pre-emption is enabled or not? We understand the retransmission timer may be longer in case pre-emption is enabled, to cover the possible retransmission resource. |
| Samsung | 1 |  |
| Nokia | 1 preferred |  |
| ASUSTeK | 1 |  |
| Apple | 1 |  |
| Qualcomm | 1 |  |
| Lenovo | 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.**

|  |  |  |
| --- | --- | --- |
| **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** |
| **LG** | Supported with a different value |  |
| **InterDigital** | Supported with a different value | **We should align Uu DRX and SL DRX behavior.** |
| Huawei, HiSilicon | Not supported, or supported with fixed value zero | we accept the support of HARQ RTT timer in case PSFCH is configured and sl-PUCCH-Config is not configured. But in case PSFCH is not configured either, we don’t see the necessity of HARQ RTT timer.  To reduce spec implementation complexity, we are fine to have it but the value should be fixed to 0. |
| CATT | Support | We prefer to have a unified method for all cases, the timer could be set as zero. |
| Vivo | Support | The case for PSFCH configured and PSFCH not-configured should be aligned, when PUCCH is not configured. |
| Samsung | Supported |  |
| Nokia | Supported |  |
| ASUSTeK | Support | The value can be zero or non-zero value. Can follow majority. |
| Apple | Not supported or only fixed as zero |  |
| Qualcomm | Supported with “0” | Same as Q2.3.1-3a Option 2 with “0” for SL DRX |
| Lenovo | Support with zero value | To align the behaviour |

One left issue as pointed out by the following paper

|  |  |  |  |
| --- | --- | --- | --- |
| **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”?**

|  |  |  |
| --- | --- | --- |
| **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.** |
| **LG** | **No strong view** | **Follow majority view.** |
| **InterDigital** | **Agree** |  |
| Huawei, HiSilicon | Agree | In our understanding it is not an unreasonable implementation. Instead, it is a network implementation which is allowed in RAN1 specification. From RAN2 specification perspective, we need to cover this case. |
| CATT | No strong view | Follow the majority. |
| vivo | Agree | It is right because even if PUCCH is configured, the DCI may not schedule PUCCH. |
| Apple | Agree |  |
| Qualcomm | Comment | This could be an error case for gNB’s configuration for PUCCH |
| Lenovo | Agree |  |

# **Summary of clause 2.3.1**

For Q2.3.1-1, majority view [12/17] is not started although no clear majority, so moderator suggest to go for majority view.

**Recommendation 2.3.1-1 [12/17]: For unicast, *sl-drx-RetransmissionTimer* is not started after expiry of *sl-drx-HARQ-RTT-Timer* when the PSFCH of ACK transmission is dropped.**

For Q2.3.1-2a, clear majority [14/17] agrees with it.

**Recommendation 2.3.1-2a [14/17]: For resource pool with PSFCH, for FB-disabled case, if SCI does not indicate re-transmission resource, *sl-drx-HARQ-RTT-Timer* starts in the slot following the end of PSFCH transmission.**

For Q2.3.1-2b, clear majority [15/17] disagrees with it. And based on the reply from opponents, moderator understand the intention is to rely on PSSCH instead of PSFCH.

**Recommendation 2.3.1-2b [15/17]: For resource pool with PSFCH, for FB-disabled case, if SCI indicates re-transmission resource, *sl-drx-HARQ-RTT-Timer* starts in the slot following the end of PSSCH transmission (i.e., currently received PSSCH).**

For Q2.3.1-2c, clear majority [16/17] agrees with it.

**Recommendation 2.3.1-2c [16/17]: For resource pool without PSFCH, *sl-drx-HARQ-RTT-Timer* starts in the slot following the end of PSSCH transmission (i.e., currently received PSSCH).**

For Q2.3.1-3a, clear majority [15/17] selects option-2.

**Recommendation 2.3.1-3a [15/17]: For resource pool without PSFCH, if SCI does not indicate re-transmission resource, allow *sl-drx-HARQ-RTT-Timer* timer length configuration different from the value for resource pool with PSFCH. The value of the RTT timer length (fixed to be zero, or allow non-zero value configuration as well) is FFS.**

For Q2.3.1-3b, clear majority [15/17] select option-1.

**Recommendation 2.3.1-3b [15/17]: For *sl-drx-RetransmissionTimer*, a single value is sufficient to cover all cases (FB-enable/disable, PSFCH configured/not-configured).**

For Q2.3.1-4, clear majority [14/17] is to support the timer. Considering some proponents and also opponents mentioned zero-value length, moderator think that can be a compromise way-out.

**Recommendation 2.3.1-4 [14/17]: For resource pool without PSFCH, if *sl-PUCCH-Config* is not configured, support *drx-HARQ-RTT-TimerSL* with a fixed value as zero.**

For Q2.3.1-5, besides the ones have no strong view, the ones agree/disagree with the proposal is 6-vs-1, so moderator suggest to go for the proposal.

**Recommendation 2.3.1-5 [6/7]: the conclusion for “*sl-PUCCH-Config* is not configured” also applied to “*sl-PUCCH-Config* is configured but PUCCH resource is not scheduled”**

|  |  |  |
| --- | --- | --- |
| **Company** | **Recommendation Number** | **Comment** |
| Ericsson | 2b, 2c | Regarding LC’s comment, could RAPP further clarify it? i.e., The meaning of "end of PSSCH resource" is ambiguous.  If "end of PSSCH resource" means the end of the currently received PSSCH, we agree the proposal. However, if "end of PSSCH resource" means the last re-tx resource scheduled by SCI, we oppose the proposal.  [Rapp] OK, clarified. |
|  |  |  |
|  |  |  |

# 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

|  |  |  |  |
| --- | --- | --- | --- |
| **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 |
| NEC | Agree |  |
| LG | Agree |  |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree | Can align with CG |
| CATT | comment | No strong view |
| vivo | Agree |  |
| Samsung | Ok with majority |  |
| Nokia | yes |  |
| ASUSTeK | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree (comment) | No strong view |
| Lenovo | Agree |  |

**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 |
| NEC | Agree |  |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree | Can align with CG |
| CATT | comment | No strong view |
| vivo | Agree |  |
| Samsung | Ok with majority |  |
| Nokia | yes |  |
| ASUSTeK | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree (comment) | No strong view |
| Lenovo | Agree |  |

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

|  |  |  |  |
| --- | --- | --- | --- |
| **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** |
| **LG** | **ACK** | **Agree with OPPO** |
| **InterDigital** | **NACK** | **We think this is more consistent with the initial transmission not being successfully performed.** |
| Huawei, HiSilicon | ACK | We prefer to follow the current spec |
| CATT | NACK | gNB will schedule another retransmission resource for UE. |
| vivo | NACK |  |
| Nokia | Comments | As was also seen from the online time spent, none of the options are really any good. Hence, even though our time is limited, we propose to discuss a bit further on solutions instead of forcing suboptimal ones. |
| ASUSTeK | NACK |  |
| Apple | NACK |  |
| Qualcomm | Comment | It’s not clear if the next retransmission grant will be at Rx UE’s active time. Prefer to have the same solution to both initial transmission and retransmission dropping due to Rx UE’s inactive state.. |
| Lenovo | ACK | Agree with OPPO |

**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.** |
| **LG** | **ACK** | **Agree with Ericsson** |
| **InterDigital** | **NACK** |  |
| Huawei, HiSilicon | ACK | Agree with OPPO |
| CATT | NACK | Align with the above case. |
| vivo | NACK |  |
| Nokia | Comments | As was also seen from the online time spent, none of the options are really any good. Hence, even though our time is limited, we propose to discuss a bit further on solutions instead of forcing suboptimal ones. |
| ASUSTeK | NACK |  |
| Apple | NACK |  |
| Qualcomm | ACK | ACK to end retransmissions. Don’t see the need for retransmission is the initial transmission hasn’t been conducted. |
| Lenovo | ACK |  |

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;**

**Option-3: at the first symbol after end of last PSSCH resource scheduled**

|  |  |  |
| --- | --- | --- |
| **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).** |
| LG | 2 |  |
| Huawei, HiSilicon | 3 | First of all, we think the added option 3 can be considered.  gNB does not know whether HARQ is enabled or disabled. Also, it is not necessary for gNB to derive the PSFCH resource location according to RAN1 spec. therefore, Option 1 is not preferred.  The gNB may schedule 1, 2 or 3 SL grants in one DCI by implementation. If option 2 is selected, the value of HARQ RTT timer should be able to cover all possibilities. If the value is not large, but gNB schedule 3 SL grants in one DCI, then it is possible the HARQ RTT timer expires when the scheduled SL grants have not even been used. In this case, the UE starts PDCCH monitor, but gNB will not schedule the UE, hence cause UE power waste unnecessarily. On the other hand, if the value is set as large enough to cover up to 3 SL grants yet gNB only schedules 1 or 2 SL grants. In this case the gNB can only schedule UE after HARQ RTT timer expiry. The gNB behaviour is unnecessarily restricted.  DCI  sl grant1  sl grant2  sl grant1  sl grant2  sl grant1  sl grant3  HARQ RTT timer  HARQ RTT timer  DCI  DCI  HARQ RTT timer  In conclusion, Option 2 will restrict the network implementation, i.e., in this case, the configured value of HARQ RTT will restrict the gNB scheduling flexibility. To avoid UE power wasting, the gNB can only schedule the SL grants during the HARQ RTT timer is running.  The added option 3 can avoid the uncertainty caused by the variable scheduled SL grants number, there will be not such issues above and the HARQ RTT timer value can be decoupled with the number of scheduled SL grants. |
| InterDigital | Option 3 | We think option 3 is preferrable for the reasons pointed out by Huawei. Furthermore, for the time between the DCI and the actual SL grant, there seems to be no need to have the UE monitor PDCCH for the same SL HARQ process.  If option 3 is not acceptable to companies, we prefer option 2 over option 1, as it aligns behavior to the case where PSFCH is not configured. |
| CATT | 2 |  |
| vivo | 2 or 3 | According to Huawei’s comment, it seems 3 can also be considered. But a longer HARQ RTT timer value can solve the concern from Huawei. |
| Samsung | Option 3 |  |
| Nokia | 2, or 3 |  |
| ASUSTeK | 2 or 3 |  |
| Apple | 2 or 3 | Our understanding is that UE can sleep after PDCCH for this HARQ process |
| Qualcomm | 3 |  |
| Lenovo | Option 3 | Agree with Huawei |

**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;**

**Option-3: at the first symbol after end of last PSSCH resource scheduled**

|  |  |  |
| --- | --- | --- |
| **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).** |
| LG | 2 |  |
| Huawei, HiSilicon | 3 | See our comments to 2.3.2-3a |
| InterDigital | 3 | Prefer 3, but can accept 2. |
| CATT | 2 |  |
| vivo | 2 or 3 |  |
| Samsung | 3 |  |
| Nokia | 2, or 3 |  |
| ASUSTeK | 2 or 3 |  |
| Apple | 2 or 3 |  |
| Qualcomm | 3 |  |
| Lenovo | 3 |  |

# **Summary of clause 2.3.2**

For Q2.3.2-1a, besides 3 companies who have no strong view, all the others support it [14/14].

For Q2.3.2-1b, besides 3 companies who have no strong view, all the others support it [13/13].

**Recommendation 2.3.2-1: For mode-1 DG [14/14] and mode-2 grant [13/13], if the initial transmission occasion was dropped due to no Rx-UE in DRX active time, TX-UE can use re-transmission occasion for initial transmission.**

For Q2.3.2-2a, although no clear majority view, the majority view [9/15] is NACK.

For Q2.3.2-2b, the ones select NACK vs ACK is 8 vs.6, so moderator suggest to go for majority view.

**Recommendation 2.3.2-2: For mode-1 re-transmission grant, if the re-transmission grant is dropped due to no Rx-UE in active time, Tx-UE report NACK to network via PUCCH [9/15, 8/14].**

For Q2.3.2-3a/3b, clear majority view [11/16] is option-2.

**Recommendation 2.3.2-3 [11/16]: If *sl-PUCCH-Config* is not configured, for both PSFCH configured and not-configured cases, *drx-HARQ-RTT-TimerSL* starts at the first symbol after end of PDCCH resource.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Recommendation Number** | **Comment** |
|  |  |  |
|  |  |  |
|  |  |  |

# 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 |  |
| NEC | See comment | Since RAN1#106bis agreed the following WA, we are not sure whether the active time is really needed to be provided to the PHY layer.  Option 2: PHY layer selects and reports candidate resources in which at least a subset of the candidate resources is within the indicated active time of the RX UE |
| LG | Support | Since the active time given by the MAC to the PHY and the active time referenced when selecting a resource are not different, there seems to be no reason for the text of the active time to be different from the text of the resource selection.  We suggest blow modification:  3> if one or multiple SL DRX is configured in the UE(s) receiving SL-SCH data:  4> indicate to the physical layer SL DRX Active time where SL DRX timers are running now or will be running in the future in UE(s) receiving SL-SCH data.  NOTE 3C: SL DRX timers that will be running in the future at least include SL onduration timer and how to consider other timers is left to UE implementation. |
| InterDigital | Support |  |
| Huawei, HiSilicon | Support |  |
| CATT | Support |  |
| vivo | support |  |
| Samsung | Support |  |
| Nokia | Can support | However, we are not sure that it is aligned with the RAN1 agreement that the resources provided may also include the ones which are not in the active time |
| ASUSTeK | Support |  |
| Apple | Support |  |
| Qualcom | Support |  |
| Lenovo | 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 |  |
| LG | See comment | Same view with Intel. We are a bit unsure to agree to such a blanket statement at this time when we have not discussed the details |
| InterDigital | Disagree | If we specify rules for providing the active time to the PHY layer, these rules should be comprehensive. |
| CATT | Agree |  |
| vivo | Disagree | Agree with Intel. We should first discuss which information is useful first, and then considering the spec impact, to decide whether we need normative text or leave it to UE implementation. |
| Nokia | Disagree |  |
| Huawei, HiSilicon | Agree |  |
| Apple | No | MAC-PHY interaction has to be more clear, left to UE implementation will lead to sub-par performance. |
| Qualcomm | Comment | Agree EXCEPT for L2 destination ID, since it defined when the ON duration starts for BC/GC and which Rx UE for unicast.. |
| Lenovo | See comment | Similar view as Intel |

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>. |
| LG | Option 1 with modification | 4> randomly select the time and frequency resources for one transmission opportunity from the resources that are indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] and are within SL DRX Active time where SL DRX timers that are running and will be running in the future in the UE(s) receiving SL-SCH data, 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: SL DRX timers that will be running in the future at least include SL onduration timer and how to consider other timers is left to UE implementation. |
| InterDigital | Option 1 | We think option 2 defeats the purpose of having certain timers (e.g. retransmission timer). At the time of resource selection, the retransmission timer for a HARQ process is not running, but it will be running as a result of the initial transmission. So the retransmission resource can be selected outside of the active time. |
| Huawei, HiSilicon | Option 2 |  |
| CATT | 1 and 2 | The combined one is more detailed to describe the procedure for initial transmission. |
| vivo | 1 |  |
| Samsung | Option 1 |  |
| Nokia | 1 and 2 |  |
| ASUSTeK | 1 and 2 |  |
| Apple | 1 |  |
| Qualcomm | 1 and 2 |  |
| Lenovo | Option 1 |  |

**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 |  |
| LG |  | Same comment as in Q2.3.3-1b |
| InterDigital | Disagree | Same comment as in Q2.3.3-1b |
| CATT | Disagree | In our view, initial/re-transmission needs to considered, since the UE determination to active time for initial/re-transmission may be different. For example, the initial transmission needs to be determined in the SL DRX timer that are running currently, the re-transmission could be determined in the SL DRX timer that will be running in the future. |
| Vivo | Disagree | See comments in Q2.3.3-1b |
| Nokia | Disagree |  |
| Huawei, HiSilicon | Disagree | Same view as Ericsson, we believe at least cast type differentiation is needed. The main reason is that when SL DRX is adopted in groupcast, the SL retransmission timer status among the multiple Ues in the same group may be misaligned, which may lead to packet loss in RX UE(s). For instance, for a SL transmission, some RX Ues may decode the data successfully, and thus sends ACK to TX UE and does not start retransmission timer after the corresponding HARQ RTT timer expires, while other RX Ues may not decode the data successfully, and thus sends NACK to TX UE and starts the retransmission timer. At TX UE side, it will start a timer corresponding to the retransmission timer for the SL process when it receives NACK from any RX-UE. Accordingly, if TX UE in this case schedules retransmission of other SL process or initial transmission of any SL process, the RX Ues that sent ACK may suffer from packet loss of that SL process.  Note that this issue is different from the previous discussed issue of inactivity timer mismatch between TX UE and RX UE, where the reason is that RX UE mis-detects the SCI for new transmission from TX UE and thus does not start inactivity timer, while TX UE start inactivity timer after the SCI transmission. By contrast, for the issue here, RX UE does detect the SCI from TX UE, but the retransmission timers mismatch between different RX Ues in the same group, which comes from the different status of RX Ues on whether the data are decoded successfully or not. It is understandable that such mismatch among different RX Ues in a group could be quite common.  To avoid the occurrence of such packet loss as shown above, a simple method is to specify that:  - Initial transmission is only allowed during the time when onduration timer or inactivity timer is running,  - 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. |
| Apple | Disagree |  |
| Qualcomm | Disagree | The timer-based operations differs among different cast types: unicast, groupcast and broadcast. |
| Lenovo | Comments | Same comment as in Q2.3.3-1b |

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. |
| InterDigital | Yes | We agree with this approach and think it can be implemented entirely in the MAC. |
| CATT | Disagree | It could be considered as UE implementation. |
| LG | Agree |  |
| vivo | Agree |  |
| Samsung | Yes |  |
| Nokia | Agree |  |
| Huawei, HiSilicon | Disagree | UE can just reselect a resource that is in active time due to any cause. For example in case that on-duration timer and/or inactivity timer is running earlier than the pre-empted resource, UE should be allowed to select a resource in the time while on-duration timer or inactivity timer is running. To restrict UE not to do so would be strange. |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| Lenovo | Yes |  |

**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 |
| LG | No strong view |  |
| InterDigital | See comment | Although we agree the behaviour is entirely in the MAC, we think informing RAN1 is beneficial (as FYI) since pre-emption is designed in RAN1 |
| CATT | No |  |
| vivo | See comment | Share the view from Interdigital as RAN1 should be aware of resource selection related issues. |
| Samsung | Send LS | Agree with InterDigital. Also we probably send LS to RAN1 to inform other agreements, then why not include it also? |
| Apple | No strong view | We are fine to send a LS, but the agreement in RAN2 shall have no impact on current RAN1 agreements |
| Qualcomm | No strong view | Resource reselection is RAN2’s decision. To let RAN1 know RAN2’s decision is OK, no strong preference, |
| Lenovo | No |  |

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 |  |
| NEC | Option 1 or 2 |  |
| LG |  | If resources for the data that is available for transmission on the logical channel do not fall into the SL DRX active time of any destination, resource selection can be triggered. |
| InterDigital | None | If resource selection is done respecting the active time, then this is not needed. |
| Huawei, HiSilicon | Option 1 and Option 2 | For Option 1,  - To OPPO: the previous agreement about “drop the grant” is about the case when a mode-1 SL grant is provided by network to Tx-UE as follows, which is different from the case here. Note that resource reselection trigger only exists in mode 2.   |  | | --- | | Agreements on SL DRX for mode 1:  1: For the issue that a mode-1 SL grant being provided by network to Tx-UE yet it is not in SL active time of any destination that has data to be sent, for initial transmission, drop the grant. FFS if any spec change.  2: For the issue that a mode-1 SL grant being provided by network to Tx-UE yet it is not in SL active time of any destination that has data to be sent, for retransmission, drop the grant. |   - To Xiaomi: we think the “reserved resources” in Option 1 actually means the selected resources using mode2, which is not equal to the announced periodic transmissions in the following working assumption. So Option 1 is valid.   |  | | --- | | 9: Working assumption: slots associated with the announced periodic transmissions by the TX UE are considered as SL active time of the RX UE. |   For option 2, when SL data is available, UE needs to perform TX resource (re-)selection check, if there is no SL grant in the SL DRX active time of the destination of the SL data, the TX resource (re-)selection is triggered to select SL grant. |
| CATT | Option 2 | Agree with Intel, it is MAC work to trigger resource reselection, since it is not sure PHY will give the grant in the active time of destination UE. |
| vivo | None | PHY layer would provide resources that at least subset of them is in active time. |
| Samsung | None |  |
| Nokia | None | Agree with Vivo |
| ASUSTeK | Option 2 |  |
| Apple | At least 2 | As PHY layer may not always gives the appropriate resource candidates to allow MAC layer to have sufficient resource to use, we think reselection is needed. |
| Qualcomm | Option 2 |  |
| Lenovo | Option 2 |  |

# **Summary of clause 2.3.3**

For Q2.3.3-1a, clear majority [17/18] supports it. W.r.t the further rewording suggestion (as commented by LG), we can further polish it during running-CR discussion.

**Recommendation 2.3.3-1a [17/18]: Capture the “MAC layer provides active-time to PHY layer” in normative text as baseline (further discussion on the wording can be done in running-CR discussion).**

For Q2.3.3-1b, 6 companies agree, 5 companies disagree, and 4 companies did not provide direct Yes/No answer. Given the controversial situation, moderator understand finally it is about to what extent companies expect normative spec vs. UE implementation (including capturing using a NOTE). In order to move forward, after discussion with Chairman, moderator suggest the following WF, i.e., use a TP to represent the view from both sides as input to 117 online discussion/decision. Moderator will discuss with both camps to generate a TP to submit to 117 (as late submission).

**Recommendation 2.3.3-1b [?/15]: For the step of MAC layer providing active-time to PHY layer, RAN2 further discuss whether/how to specify the left details besides the normative text of Recommendation 2.3.3-1a, e.g., via either a NOTE or a normative text (a TP is to be provided for either case).**

For Q2.3.3-2a, the ones support option-1 and option-2 are 12 vs. 11, i.e., equal voting ratio. Considering the delta part is mainly the “SL DRX timer that are running and will be running in the future” in option-2, while for option-2, companies support / not-support it is 10 vs. 7. So moderator suggest to go for the majority view (although no clear majority).

**Recommendation 2.3.3-2a [10/17]: Capture resource selection “within SL DRX Active time where SL DRX timers that are running and will be running in the future” in normative text as baseline (further discussion on the wording can be done in running-CR discussion).**

For Q2.3.3-2b, 4 companies agree, 9 companies disagree, and 3 companies did not provide direct Yes/No answer. Given the controversial situation, moderator understand finally it is about to what extent companies expect normative spec vs. UE implementation (including capturing using a NOTE). In order to move forward, after discussion with Chairman, moderator suggest the following WF, i.e., use the NOTE and a concrete TP to represent the view from both sides as input to 117 online discussion/decision. Moderator will discuss with both camps to generate a TP to submit to 117 (as late submission). Furthermore, one separate issue as raised by Ericsson/Huawei is to be further discussed for GC.

**Recommendation 2.3.3-2b [?/16]: For the step of MAC layer perform resource (re)selection based on the resource set reported by PHY layer, RAN2 further discuss the issue on resources (re)selection for initial/re-transmission for group-cast.  Other than that, RAN2 further discuss whether/how to specify the left details besides the normative text of Recommendation 2.3.3-2a, e.g., via either a NOTE or a normative text (a TP is to be provided for either case).**

For Q2.3.3-3a, majority [12/16] support it, moderator suggest to go for it.

**Recommendation 2.3.3-3a [12/16] for resource reselection due to pre-emption, the reselected resource should not be earlier than the pre-empted resource in time domain.**

For Q2.3.3-3b, besides the ones have no strong view, the ones who support it and not-support is 1 vs. 6, so no proposal needed.

For Q2.3.3-4, the supporting ratio condition-1 and condition-2 is 3/18 and 11/18, so moderator suggest to check condition-2.

**Recommendation 2.3.3-4 [11/18], If there is no SL grant in the SL DRX active time of the destination that has data to be sent, trigger resource reselection.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Recommendation Number** | **Comment** |
|  |  |  |
|  |  |  |
|  |  |  |

# 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** |  |
| NEC | 1 | Less signalling overhead. |
| InterDigital | 1 | We think a UE should support all cast types equally |
| Huawei, HiSilicon | 1 | In Rel-16, we don’t have separate capability for unicast, groupcast and broadcast. For DRX, we also don’t see the necessity. |
| CATT | 1 | Prefer to use a single capability for all cast types. |
| LG | 1 |  |
| vivo | 2 | SL DRX for Bcast/Gcast needs much simpler operations than SL DRX for Ucast for which many extra things related to PC5 exchange, e.g. acceptance and reject, assistance info exchange, SL DRX MAC CE, etc. are required. However, if a single capability covering all cast types is specified, it means that as long as a UE wants to support SL-DRX feature (irrespective of for what specific cast type), it has to support all above complicated operations, thus not leaving any room for a simple version of UE implementation that chooses to support the SL-DRX for Bcast/Gcast only. Note that such UE implementation supporting only Bcast/Gcast SL-DRX makes big sense, with not supporting SL-DRX for Ucast being unlikely to introduce any problem with the help of UE capability exchange. |
| Samsung | 1 |  |
| Nokia | 1 |  |
| Apple | 1 |  |
| Qualcomm | 1 |  |
| Lenovo | 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** |  |
| NEC | 1 |  |
| InterDigital | 1 |  |
| CATT | 1 |  |
| LG | 1 |  |
| vivo | 1 | It seems better to have the UE supporting SL-DRX support also SL-DTX. Otherwise, if there are many UEs choosing supporting only SL-DRX (for its own power-saving benefit) but not supporting SL-DTX (not caring about peer’s SL-DRX), the SL-DRX will not really work well from a system level point of view, because it will be at the sacrifice of performance degradation due to packet loss. |
| Samsung | 1 |  |
| Nokia | 1 |  |
| Huawei, HiSilicon | 1 |  |
| Apple | 1 |  |
| Qualcomm | 1 |  |
| Lenovo | 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** |  |
| NEC | Agree |  |
| InterDigital | Agree |  |
| Huawei, HiSilicon | Agree |  |
| CATT | Agree |  |
| LG | Agree |  |
| vivo | Agree |  |
| Samsung | See comment | If we have single capability for all cast types, what “BC related capability” means? |
| Nokia | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree comment | We agree to use default SL DRX for broadcast (i.e. only Cycle length and On duration) for UC-based DCR, but not clear the capability related to BC if only one capability is defined. |
| Lenovo | 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 differentiation  with capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory  per-UE capability  Without capability bit in PC5-RRC  With capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory  per-UE capability  Without capability bit in PC5-RRC  With 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 differentiation  with capability bits in PC5-RRC, with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory  per-UE capability  Without capability bit in PC5-RRC  With capability bit in Uu-RRC with no FR1-FR2 or FDD-TDD differentiation | Conditionally mandatory  per-UE capability  Without capability bit in PC5-RRC  With 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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | Disagree | Same view as Xiaomi |
| Huawei, HiSilicon | Disagree | As replied in 2.3.4-1b and 2.3.4-1c, we don’t need to differentiate DTX and DRX, nor cast types. |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree | Same view as Xiaomi |
| vivo | Agree with comments | For Ucast SL-DRX, please also refer to our comments to **Q2.3.4-1b** (single capability common for DTX and DRX). |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Apple | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

**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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | Disagree | Same view as Xiaomi |
| Huawei, HiSilicon | Disagree | Same comments as in 2.3.4-1d |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree |  |
| vivo | FFS for GC/BC | We can understand the intention to make GC/BC SL-DRX a conditional mandatory feature for UEs implementing Rel-17 eSL. But we’d like to hear companies’ views on whether this is acceptable from the perspective of e.g. UE implementation complexity. |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Apple | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

**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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | Disagree |  |
| Huawei, HiSilicon | Disagree | Same comments as in 2.3.4-1d |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree |  |
| vivo | FFS for GC/BC | We can understand the intention to make GC/BC SL-DRX a conditional mandatory feature for UEs implementing Rel-17 eSL. But we’d like to hear companies’ views on whether this is acceptable from the perspective of e.g. UE implementation complexity. |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Apple | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

**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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | disagree |  |
| Huawei, HiSilicon | Disagree | Same comments as in 2.3.4-1d |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree |  |
| vivo | Agree with comments | For Ucast SL-DRX, please also refer to our comments to **Q2.3.4-1b** (single capability common for DTX and DRX). |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Appe | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

**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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | Disagree |  |
| Huawei, HiSilicon | Disagree | Same comments as in 2.3.4-1d |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree |  |
| vivo | FFS for GC/BC | We can understand the intention to make GC/BC SL-DRX a conditional mandatory feature for UEs implementing Rel-17 eSL. But we’d like to hear companies’ views on whether this is acceptable from the perspective of e.g. UE implementation complexity. |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Apple | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

**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 |
| NEC | disagree | Same view as Xiaomi. One bit is enough. |
| InterDigital | Disagree |  |
| Huawei, HiSilicon | Disagree | Same comments as in 2.3.4-1d |
| CATT | Disagree | No strong view, but 1 bit is preferable. |
| LG | Disagree |  |
| vivo | FFS for GC/BC | We can understand the intention to make GC/BC SL-DRX a conditional mandatory feature for UEs implementing Rel-17 eSL. But we’d like to hear companies’ views on whether this is acceptable from the perspective of e.g. UE implementation complexity. |
| Samsung | Disagree | Agree with Xiaomi. |
| Nokia | No |  |
| Apple | No |  |
| Qualcomm | disagree | Share Xiaomi’s view |
| Lenovo | Disagree | Same view as Xiaomi |

# 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** |  |
| NEC | Agree |  |
| InterDigital | Yes |  |
| Huawei, HiSilicon | Yes with comments | Our understanding one capability is needed to indicate the UE support the feature of Uu DRX for SL operation. However, the current description of the capability in the question might be misleading that the capability is only for RTT timer and retransmission timer. In fact this feature also impact the inactivity timer handling.  So we think the description of the capability should be updated. |
| CATT | Agree |  |
| LG | Agree |  |
| **vivo** | **Agree** | FFS whether SL-DRX capability is the prerequisite for this SL-specific Uu DRX. |
| Samsung | See comment | Not sure why UE release information and capability of SL support is not enough. |
| Nokia | Yes |  |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| Lenovo | Yes |  |

**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** |  |
| NEC | Agree |  |
| Huawei, HiSilicon | Agree |  |
| CATT | Agree |  |
| LG | Agree |  |
| **vivo** | **Agree with comment** | FFS whether SL-DRX capability is the prerequisite for this SL-specific Uu DRX (this may have impact on the optionality of this capability). |
| Samsung | Agree |  |
| Nokia | Yes |  |
| Apple | Agree |  |
| Qualcomm | No disagree (agree) |  |
| Lenovo | Agree |  |

# **Summary of clause 2.3.4**

For Q2.3.4-1a, clear majority view [14/16] is option-1.

For Q2.3.4-1b, all companies [16/16] agree with option-1.

For Q2.3.4-1c, all companies tend to agree, and it aligns with the conclusion from 1a.

**Recommendation 2.3.4-1a/b/c: For SL-DRX over PC5 interface, define a single capability bit covering all cast types [14/16] and both Tx and Rx sides [16/16].**

For Q2.3.4-1d/e/f/g/h/i, not many comments provided on how to revise the detailed attributive, so moderator assume the content of the table is fine given a single bit to cover all cases.

**Recommendation 2.3.4-1d/e/f/g/h/i [?/16]: For SL-DRX over PC5 interface, define it as conditionally mandatory per-UE capability, with capability bits in PC5-RRC, with neither FR1-FR2 nor FDD-TDD differentiation, and with capability bits in Uu-RRC, with no FR1-FR2 or FDD-TDD differentiation.**

For Q2.3.4-2a, clear majority [16/16] support it.

For Q2.3.4-2b, all companies agree with it [15/15].

**Recommendation 2.3.4-2 [15/16]: For Uu-DRX for SL operation, define it as conditionally mandatory per-UE capability, with capability bits in Uu-RRC, with neither FR1-FR2 nor FDD-TDD differentiation.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Recommendation Number** | **Comment** |
| Ericsson | 1d, 2 | Reword “**no FR1-FR2 or FDD-TDD differentiation**” to “neither nor” |
|  |  |  |
|  |  |  |

# 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