**3GPP TSG-RAN WG2 #118-e R2-220XXXX**

**Online, May 09 – 20, 2022**

**Agenda item: 6.15.2.3**

**Source: LG (Rapporteur)**

**Title: [AT118-e][707][V2X/SL] MAC corrections (LG)**

**Document for: Discussion & Decision**

Introduction

This document summarizes the discussion of the following email discussion:

**[AT118-e][707][V2X/SL] MAC corrections (LG)**

**Scope:** Discuss proposals/corrections in AI 6.15.2.3 (except the pre-selected issues for online discussion). Prepare a merged CR for the agreeable proposals/corrections.

**Intended outcome:** Summary discussion in R2-2206302 and 38.321 CR in R2-2206303. Email approval.

**Deadline:** 5/16 10:00am UTC

2 Contact Information

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| --- | --- |
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# 3 Discussion on proposals

In this summary, the rapporteur asks for companies' input on whether each proposals are agreed.

## 3.1 R2-2204552 Clarification on resource re-selection for pre-empted resource with SL DRX SHARP Corporation Discussion

In RAN2#117e, it was agreed that the reselected resource should not be earlier than the pre-empted resource for resource re-selection due to pre-emption, shown as follows,

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| --- |
| Agreements on SL DRX open issues:  22: For resource reselection due to pre-emption, the reselected resource should not be earlier than the pre-empted resource in time domain. |

When the pre-emption occurs, PHY shall report the pre-empted resource and MAC layers accordingly perform resource re-selection for the pre-empted resource. It is noted that one prior SCI indicates the pre-empted resource to RX UE and the RX UE keeps monitoring SCI from the TX UE till the SL HARQ Retransmission timer expires which is initiated after RTT timer expires. If the re-selected resource comes after the SL Retransmission timer expires, the receiver UE could possibly miss the SCI. Therefore, besides the re-selected resource comes after the pre-empted resource, the time gap between the re-selected resource and pre-empted resource is not larger than the duration of SL HARQ Retransmission timer.

**Proposal 1: For resource re-selection of the pre-emption check in SL DRX, the time gap between the re-selected resource and the reported pre-empted resource is not larger than the duration of SL HARQ Retransmission timer.**

Q1: Would your company agree with proposal 1 in R2-2204552?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | No | This change is not necessary, since the TX UE anyway selects resources in the active time of the RX UE, even for the case of pre-emption. |

## 3.2 R2-2204580 Discussion on DRX left issues for user plane aspect OPPO discussion

**Proposal 1 RAN2 confirm the WA “if there is no SL grant in the SL DRX active time of the destination that has data to be sent, trigger resource reselection”.**

**Proposal 2 RAN2 confirm the WA “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”.**

* Rapporteur comment
* Proposal 1/2 will be discussed in online session.

According to the current specification, drx-RetransmissionTimerSL can never be started in case both PSFCH and PUCCH are not configured.

**Proposal 3 Add the starting condition of drx-RetransmissionTimerSL upon expiry of drx-HARQ-RTT-TimerSL in case both PSFCH and PUCCH are not configured.**

Q2: Would your company agree with proposal 3 in R2-2204580?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

## 3.3 R2-2204782 Discussion on remaining issues for user plane aspect LG Electronics France discussion

Observation 1. According to the discussion result of SA2, when there are multiple QoS flows for the same Destination Layer-2 ID, the upper layer applies a DRX-based Tx profile and a non-DRX based Tx profile for each SDU of multiple QoS flows and forwards each Tx profile to the AS layer. In this case, the MAC layer should determine whether to multiplex the DRX SDU and non-DRX SDU.

RAN2 can consider three options for this multiplexing issue below:

Option 1. Do not allow multiplexing for DRX SDU and non-DRX SDU

Option 2. Allow multiplexing for DRX SDU and non-DRX SDU, but follow DRX-based Tx profile

Option 3. Allow multiplexing for DRX SDU and non-DRX SDU, but follow the non-DRX-based Tx profile.

Observation 2. Of the three options mentioned above, we prefer option 1. This is because, among the services (or QoS profiles) associated with the same Destination Layer-2 ID, RX UE may be interested in only DRX-On Service or DRX-Off service, but TX UE is interested in both services (DRX-On Service or DRX-Off service). If the MAC PDU is transmitted in “always on mode: DRX-off” by multiplexing the both SDUs, the RX UE supporting DRX may not receive the MAC PDU transmitted by the TX UE. Therefore, we prefer to prevent the TX UE from multiplexing between DRX SDU and non-DRX SDU associated with the same destination layer-2 ID so that the RX UE can receive the packet transmitted by the TX UE.

**Proposal 1. TX UE should not multiplex between DRX SDU and non-DRX SDU associated with the same destination layer-2 ID.**

Q3: Would your company agree with proposal 1 in R2-2204782?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | No | This is not needed, since the assumption is the TX UE can respect DRX active time of the RX UE as long as at least one service/TX profile of the RX UE is configured with DRX. |

## 3.4 R2-2204864 Further consideration on SL DRX with TP for MAC spec corrections Huawei, HiSilicon discussion

Observation 1: When SL DRX is adopted in groupcast, the retransmission timer status among RX UEs in the same group may be misaligned, which may lead that the actual DRX status of some RX UEs and the assumed DRX status of these RX UEs by TX UE are not aligned.

Observation 2: When SL DRX is adopted in groupcast, after TX UE receives NACK of a SL process and start the corresponding retransmission timer, if TX UE schedules retransmission of another SL process or initial transmission of any SL process, an RX UE may suffer from packet loss of the scheduled SL process.



**Figure 2: The problem caused by different DRX status among RX UEs in SL groupcast**

**Proposal 1: In SL groupcast, TX UE selects the resources for retransmission of a SL process within the assumed time when onduration timer, inactivity timer, or the retransmission timer of this SL process is running.**

Q4: Would your company agree with proposal 1 in R2-2204864?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | comment | If the TX UE transmits the retransmission packet in the not only retransmission timer started by the corresponding HARQ process but also onduration timer and inactivity timer and transmits the initial transmission packet in the inactivity timer and onduration timer, the packet loss problem mentioned in the paper can be solved. |
| InterDigital | comment | We think this can be left to TX UE implementation, and the current specification text is sufficient. |

Observation 3: If a SCI indicates HARQ feedback disabled, the corresponding SL retransmission timer in TX UE may not be aligned with that in RX UE, which may lead to packet loss in RX UE.



Figure 3. The packet loss issue when SL HARQ feedback is disabled

**Proposal 2: To avoid the packet loss in RX UE caused by SL HARQ feedback disabled, if RX UE receives a SCI indicating HARQ feedback disabled, RX UE starts SL retransmission timer upon SL HARQ RTT timer expiry regardless of whether the data is decoded successfully or not.**

Q5: Would your company agree with proposal 2 in R2-2204864?

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| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | If the TX UE transmits the retransmission packet in the not only retransmission timer started by the corresponding HARQ process but also onduration timer and inactivity timer and transmits the initial transmission packet in the inactivity timer and onduration timer, the packet loss problem mentioned in the paper can be solved. |
| InterDigital | No | It would be preferrable to leave this to TX UE implementation and not have to introduce any RX UE behavior. |

Observation 4: The condition for not scheduling initial transmission when only a retransmission timer is running at the TX UE may be different among the vendors, which leads to different packet loss and transmission performance results at the same RX UE.

**Proposal 3: add a NOTE to specify the TX UE selects the resources for the initial transmission/retransmission associated with any active time (e.g. on duration timer or inactivity timer, or retransmission timer corresponding to received PSFCH) at the RX UE.**

Q6: Would your company agree with proposal 3 in R2-2204864?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | This issue is also same as previous proposal. If the TX UE transmits the retransmission packet in the not only retransmission timer started by the corresponding HARQ process but also onduration timer and inactivity timer and transmits the initial transmission packet in the inactivity timer and onduration timer, the packet loss problem mentioned in the paper can be solved. |
| InterDigital | No | Same view as LG |

## 3.5 R2-2204865 Clarification on Uu DRX for SL communication Huawei, HiSilicon discussion

**Proposal 1: Capture in MAC spec, when both PSFCH and PUCCH resources are not configured, start the drx-RetransmissionTimerSL for the corresponding HARQ process at the first symbol after the expiry of drx-HARQ-RTT-TimerSL.**

* Rapporteur comment
* Proposal 1 is the same issue as Correction (R2-2204574) in 4.1, and is dealt with by discussing the corresponding CR.

**Proposal 2: Capture in MAC spec, when the PUCCH resource is configured, the start time of drx-HARQ-RTT-TimerSL for configured sidelink grant reuses that for dynamic sidelink grant.**

* Comment from MAC CR rapporteur point of view on this correction
* Since the PDSCH including the RRC configuration for SL CG type 1 is also scheduled as the PDCCH, the existing text below covers both DG case and CG case (type 1 and type 2). Correction is not necessary.

|  |
| --- |
| 2> if the PDCCH indicates an SL transmission:  3> if the PUCCH resource is configured:  4> start the *drx-HARQ-RTT-TimerSL* for the corresponding HARQ process in the first symbol after the end of the corresponding PUCCH transmission carrying the SL HARQ feedback; or  4> start the *drx-HARQ-RTT-TimerSL* for the corresponding HARQ process in the first symbol after the end of the corresponding PUCCH resource for the SL HARQ feedback when the PUCCH is not transmitted due to UL/SL prioritization;  4> stop the *drx-RetransmissionTimerSL* for the corresponding HARQ process.  3> else:  4> start the *drx-HARQ-RTT-TimerSL* for the corresponding HARQ process at the first symbol after end of PDCCH occasion;  4> stop the *drx-RetransmissionTimerSL* for the corresponding HARQ process. |

Q7: Would your company agree with proposal 2 in R2-2204865?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | Since the PDSCH including the RRC configuration for SL CG type 1 is also scheduled as the PDCCH, the existing text below covers both DG case and CG case (type 1 and type 2). Correction is not necessary. |
| InterDigital | No | Same view as LG |

**Proposal 3: Capture in MAC spec, when the PUCCH resource is not configured, start the drx-HARQ-RTT-TimerSL for the corresponding HARQ process at the first symbol after end of PSSCH occasion for configured sidelink grant.**

* Comment from MAC CR rapporteur point of view on this correction
* Corresponding RAN2 agreement of this issues is common solution for SL CG and dynamic grant. RAN2 discussed this issue sufficiently in the last meeting and reached an agreement on the starting point of the RTT timer as the PDCCH reception time. I don't think further discussion is necessary.

#117-e RAN2 agreement:

* 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.

Q8: Would your company agree with proposal 3 in R2-2204865?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | Corresponding RAN2 agreement of this issues is common solution for SL CG and dynamic grant. RAN2 discussed this issue sufficiently in the last meeting and reached an agreement on the starting point of the RTT timer as the PDCCH reception time. No future discussion is required. |
| InterDigital | No | Same view as LG. |

## 3.6 R2-2204946 Combination of SL DRX, Discovery and relay-related Communication CATT discussion

According to the description in current published TS38.321 [1], how to support SL DRX for L2/L3 U2N relay and non-relay discovery has not been captured till now. For example, in TS38.321, when performing destination selection during LCP, for sidelink discovery and relay-related communication, active time is not considered:

Hence, RAN2 should first discuss whether the combination of SL DRX, discovery and relay-related communication should be reflected in the specs of Rel-17.

**Proposal 1: Suggest RAN2 to discuss whether the combination of SL DRX, discovery and relay-related communication should be reflected in Rel-17 specs.**

**Proposal 2: If the combination of SL DRX, discovery and relay-related communication should be reflected in Rel-17 specs, suggest RAN2 to discuss how to handle the L2 U2N relay when modifying the specs since there is no agreement on whether SL DRX can be supported for L2 U2N relay.**

Q9: Would your company agree that RAN2 needs to discuss whether the combination of SL DRX, discovery and relay-related communication should be reflected in Rel-17 specs?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| InterDigital | comment | This seems to be discussed in another email discussion [709] |

Q9-1: If your company answered yes to question 10, would your company agree that RAN2 needs to discuss how to handle the L2 U2N relay when modifying the specs since there is no agreement on whether SL DRX can be supported for L2 U2N relay?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| InterDigital | comment | This seems to be discussed in another email discussion [709] |

## 3.7 R2-2205105 Discussion on user plane FFS issues for SL DRX ZTE Corporation, Sanechips discussion

**Proposal1: RAN2 is suggested to confirm the working assumption: If there is no SL grant in the SL DRX active time of the destination that has data to be sent, trigger resource reselection.**

**Proposal2： 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.**

* Rapporteur comment
* Proposal 1/2 will be discussed in online session.

**Proposal3: It is suggested to re-use legacy UE behaviour and leave resource selection to UE implementation when SL DRX is configured.**

* Rapporteur comment
* For this issue, RAN2 came up with a compromised solution below by writing the text “may” for the UE implementation as a result of the discussion in the last meeting. As this is a result based on sufficient discussion, no further discussion is required.

|  |
| --- |
| 5.28.2 Behaviour of UE transmitting SL-SCH Data  The UE transmitting SL-SCH Data should keep aligned with its intended UE receiving the SL-SCH Data regarding the SL DRX Active time as specified in clause 5.28.1.  Furthermore, the UE transmitting SL-SCH Data determines the SL DRX active time based on SL DRX timers that are running (e.g., *sl-drx-onDurationTimer*, *sl-drx-InactivityTimer*, *sl-drx-RetransmissionTimer*) or will be running in the future (e.g., *sl-drx-onDurationTimer*, *sl-drx-InactivityTimer*, *sl-drx-RetransmissionTimer*) at the UE(s) receiving SL-SCH data. The UE may select resource for the initial transmission of groupcast within the time when *sl-drx-onDurationTimer* or *sl-drx-InactivityTimer* of the destination is running.  NOTE: A UE may assume that a resource for retransmission is in the active time if an initial transmission causes the *sl-drx-RetransmissionTimer* to be started at the receiving UE. |

Q10: Would your company agree with re-discussing (e.g., leave resource selection to UE implementation) resource selection procedure considering SL DRX active time of Rx UE?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | For this issue, RAN2 came up with a compromised solution below by writing the text “may” for the UE implementation as a result of the discussion in the last meeting. As this is a result based on sufficient discussion, no further discussion is required. |
| InterDigital | No | We should not re-open the discussion at this time. |

## 3.8 R2-2205136 Discussion on SL MAC aspects ASUSTeK discussion

**Proposal 1: sl-drx-SlotOffset calculation should be DST layer-2 ID** **modulo the number of slots in one millisecond.**

**Proposal 2: RAN2 selects one of the following options regarding SR triggering and SL DRX command indication:**

**Option 1: SL DRX command indication does not trigger a Scheduling Request.**

**Option 2: SL DRX command indication can trigger a Scheduling Request. Clarify in the specification that which logical channel triggered a Scheduling Request for SL DRX command indication is up to UE implementation.**

* Rapporteur comment
* Proposal 1/2 will be discussed in online session.

Similar scenarios where PUCCH is not successfully transmitted should also be considered, such as the situation when the PUCCH is not transmitted due to a measurement gap or a LBT failure.

**Proposal 3: The UE should start HARQ RTT timer for the corresponding HARQ process in the first symbol after the end of corresponding PUCCH resource when the PUCCH is not transmitted due to a measurement gap or a LBT failure.**

Q11: Would your company agree with proposal 3 in R2-2205136?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | Follow majority view |  |
| InterDigital | Yes |  |

**Proposal 4: The UE should start drx-RetransmissionTimerSL in the first symbol after the expiry of drx-HARQ-RTT-TimerSL when the PUCCH is not transmitted due to a measurement gap or a LBT failure.**

Q12: Would your company agree with proposal 4 in R2-2205136?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | Follow majority view |  |
| InterDigital | No | We think this has no specification impact since the starting time of the retransmission timer is always the same. |

According to current MAC specification, when resetting the MAC entity (not SL-specific MAC reset), the UE stops all (running) timers. This could lead to UE stopping timers running on PC5 connection in addition to timers on Uu. In other words, SL DRX timers (i.e. sl-drx-onDurationTimer, sl-drx-InactivityTimer, sl-drx-RetransmissionTimer, sl-drx-HARQ-RTT-Timer) will be stopped due to MAC reset for Uu scenarios (e.g. RLF, reconfiguration with sync, etc), which will lead to data loss as the UE stops monitoring SCI. Therefore, we propose that when resetting MAC entity, the UE does not stop SL DRX timers for SCI monitoring (See Annex for proposal 5).

**Proposal 5: The UE does not stop SL DRX timers (i.e. sl-drx-onDurationTimer, sl-drx-InactivityTimer, sl-drx-RetransmissionTimer, sl-drx-HARQ-RTT-Timer) when resetting the MAC entity.**

Q13: Would your company agree with proposal 5 in R2-2205136?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Detailed Comments** |
| LG | No | The current text is not interpreted as stopping the timer related to SL DRX when Uu MAC reset occurred. |
| InterDigital | No | Agree with LG. |

## 3.9 R2-2205536 MAC open issues Samsung discussion

**[Proposal 1]: RAN2 is asked to confirm the working assumption “if there is no SL grant in the SL DRX active time of the destination that has data to be sent, trigger resource reselection.” as an agreement.**

**[Proposal 2]: RAN2 is asked to confirm the working assumption “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” as an agreement.**

* Rapporteur comment
* Proposal 1/2 will be discussed in online session.

## 3.10 R2-2205833 Discussion on active time of SL DRX for the announced periodic transmissions Nokia, Nokia Shanghai Bell discussion

**Proposal 1: RAN2 to agree that the active time of SL DRX may be extended even after the announced periodic transmission i.e. due to pre-emption.**

**Proposal 2: RAN2 to agree that the extension may be (pre)configured.**

**Proposal 3: If the above proposal is agreed, RAN2 to agree and endorse the text proposals for TS38.300 of Annex A.**

* Rapporteur comment
* Proposal 1/2/3 will be discussed in online session.

# 4 Discussion on corrections

In this summary, the rapporteur asks for companies' input on whether each corrections are agreed.

## 4.1 R2-2204574 Correction on user plane aspects for SL DRX OPPO CR

4.1.1

According to RAN2 agreement drx-RetransmissionTimerSL is supported no matter PUCCH is configured or not.

*When sl-PUCCH-Config is not configured, the SL-specific drx-RetransmissionTimer should be supported.*

While in section 5.7 of the current specification the drx-RetransmissionTimerSL starting condition is missing for the case of both PSFCH and PUCCH not being configured, which means drx-RetransmissionTimerSL can never be started in case neither PSFCH nor PUCCH are configured.

Correction 1

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| --- |
| 1> if a *drx-HARQ-RTT-TimerSL* expires:  2> if a HARQ NACK feedback for the corresponding HARQ process is transmitted on PUCCH; or  2> if a HARQ NACK feedback for the corresponding HARQ process is not transmitted on PUCCH due to UL/SL prioritization; or  2> else if the PUCCH resource is not configured for the SL grant:  3> start the *drx-RetransmissionTimerSL* for the corresponding HARQ process in the first symbol after the expiry of drx-HARQ-RTT-TimerSL. |

Q14: Would your company agree with the correction 1 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

4.1.2

The agreement on “*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.*” is already captured in 5.22.1.3.1 as “*1> if the sidelink grant is a dynamic sidelink grant or* ***selected sidelink grant*** *and no MAC PDU has been obtained in the previous sidelink grant: 2> (re-)associate a Sidelink process to this grant, and for the associated Sidelink process:*”, i.e., if there is no MAC PDU obtained for initial transmission, UE can associate a new sidelink process to this grant and allow initial transmission in re-transmission occasion. So the related part in 5.22.1.1 should be removed to avoid duplication;

Correction 2

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| --- |
| 5.22.1.1 SL Grant reception and SCI transmission  ~  3> if not configured by RRC, *interUECoordinationScheme1Explicit* or *interUECoordinationScheme1Condition* enabling reception of preferred resource set and non-preferred resource set:  4> if transmission based on random selection is configured by upper layers:  5> randomly select the time and frequency resources for one transmission opportunity from the resource pool which occur within the SL DRX active time as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX active time above, 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. |

* Comment from MAC CR rapporteur point of view on this correction
* Following RAN2 agreement also implies that the UE uses the re-transmission occasion as the initial transmission when there is a MAC PDU to be transmitted by the UE and the initial transmission occasion does not belong to the DRX active time of the RX UE (e.g., due to resource reselection by re-evaluation/pre-emption). Therefore, the text corresponding to the strikethrough in the correction should be kept.

RAN2 agreement:

*- “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”*

Q15: Would your company agree with the correction 2 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | No | Following RAN2 agreement also implies that the UE uses the re-transmission occasion as the initial transmission when there is a MAC PDU to be transmitted by the UE and the initial transmission occasion does not belong to the DRX active time of the RX UE (e.g., due to resource reselection by re-evaluation/pre-emption). Therefore, the text corresponding to the strikethrough in the correction should be kept.  \*RAN2 agreement:  *- “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”* |
| InterDigital | No | Agree with rapporteur |

4.1.3

In section 5.22.1.3.1, the “*when PSCCH duration(s) and 2nd stage SCI on PSSCH of the previous sidelink grant is not in SL DRX Active time as specified in clause 5.28.1 of the destination that has data to be sent”* can be removed since the “*select a Destination associated to one of unicast, groupcast and broadcast, that is in the SL active time for the SL transmission occasion if SL DRX is applied for the destination,*” in LCP procedure can already cover this case.

Correction 3

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| --- |
| 5.22.1.3.1 Sidelink HARQ Entity  The MAC entity includes at most one Sidelink HARQ entity for transmission on SL-SCH, which maintains a number of parallel Sidelink processes.  The maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 16. A sidelink process may be configured for transmissions of multiple MAC PDUs. For transmissions of multiple MAC PDUs with Sidelink resource allocation mode 2, the maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 4.  A delivered sidelink grant and its associated Sidelink transmission information are associated with a Sidelink process. Each Sidelink process supports one TB.  For each sidelink grant, the Sidelink HARQ Entity shall:  1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or  1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in an *sl-PeriodCG* of the configured sidelink grant; or  1> if the sidelink grant is a dynamic sidelink grant or selected sidelink grant and no MAC PDU has been obtained in the previous sidelink grant:  NOTE 1: Void.  2> (re-)associate a Sidelink process to this grant, and for the associated Sidelink process: |

Q16: Would your company agree with the correction 3 in R2-2204574?

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| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Follow majority view |  |
| InterDigital | Yes |  |

4.1.4

In section 5.22.1.3.1, no need for explicit description of “*ignore the sidelink grant*” behaviour for initial transmission in the specification since it is the result from LCP procedure, i.e., when LCP procedure fails to find available destination of which the DRX is at active time, no PDU would be generated for the grant, and the HARQ buffer would be flushed according to the text (if no MAC PDU has been obtained) “*flush the HARQ buffer of the associated Sidelink process*” in 5.22.1.3.1.

Correction 4

|  |
| --- |
| 5.22.1.3.1 Sidelink HARQ Entity  ~  For each sidelink grant, the Sidelink HARQ Entity shall:  1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or  1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in an *sl-PeriodCG* of the configured sidelink grant; or  1> if the sidelink grant is a dynamic sidelink grant or selected sidelink grant and no MAC PDU has been obtained in the previous sidelink grant when PSCCH duration(s) and 2nd stage SCI on PSSCH of the previous sidelink grant is not in SL DRX Active time as specified in clause 5.28.1 of the destination that has data to be sent:  NOTE 1: Void.  2> (re-)associate a Sidelink process to this grant, and for the associated Sidelink process: |

* Comment from MAC CR rapporteur point of view on this correction
* In terms of clearly specifying the RAN2 agreement, it is preferable to keep the current text.

#117-e RAN2 agreement:

* When mode 1 SL grant is not in SL active time of any destination that has data to be sent, for initial transmission and the mode 1 grant is dropped, UE sends ACK to gNB.

Q17: Would your company agree with the correction 4 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | No | In terms of clearly specifying the RAN2 agreement, it is preferable to keep the current text. If the term "ignore" is inappropriate, the agreement itself can be modified to "drop".  - #117-e RAN2 agreement:  When mode 1 SL grant is not in SL active time of any destination that has data to be sent, for initial transmission and the mode 1 grant is dropped, UE sends ACK to gNB. |
| InterDigital | No | We think it would be best to keep the current text for clarity |

4.1.5

In section 5.28.2, cast type cannot be associated to both groupcast and broadcast.

Correction 5

|  |
| --- |
| When one or multiple SL DRX is configured, the MAC entity shall:  1> if multiple SL DRX Cycles that are mapped with multiple *SL-QoS-Profiles* of a Destination Layer-2 ID and interested cast type is associated to groupcast or broadcast: |

Q18: Would your company agree with the correction 5 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

4.1.6

In section 5.28.2, the “*if the HARQ feedback (i.e., negative acknowledgement) is not transmitted for unicast due to UL/SL prioritization*” condition in 5.28.2 is already covered by the previous “*the data of the corresponding Sidelink process was not successfully decoded*” condition.

Correction 6

|  |
| --- |
| 1> if an *sl-drx-HARQ-RTT-Timer* expires:  2> if the data of the corresponding Sidelink process was not successfully decoded:  3> start the *sl-drx-RetransmissionTimer* for the corresponding Sidelink process in the first slot after the expiry of *sl-drx-HARQ-RTT-Timer*. |

* Comment from MAC CR rapporteur point of view on this correction
* In terms of clearly specifying the RAN2 agreement, it is preferable to keep the current text.

RAN2 agreements:

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

Q19: Would your company agree with the correction 6 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | No | In terms of clearly specifying the RAN2 agreement, it is preferable to keep the current text.  RAN2 agreements:   * *If the RX UE does not transmit PSFCH for a HARQ enabled transmission (e.g. due to UL/SL prioritization or ACK) the RX UE still starts the HARQ RTT timer in the symbol/slot following the end of PSFCH resource.* * *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.* |
| InterDigital | No | We don’t agree that the first condition is sufficiently clear to cover the UL/SL prioritization case. |

4.1.7

In section 5.28.2, the following agreement on inactivity timer starting in groupcast caused by new data transmission is missing in the stage-3 specification, and should be captured.

*For groupcast, the TX UE restarts its timer corresponding to inactivity timer for the L2 destination ID (used for determining the allowable transmission time) upon reception of new data with the same destination ID.*

Correction 7

|  |
| --- |
| 5.28.2 Behaviour of UE receiving SL-SCH Data  1> if the SCI indicates a new transmission where the cast type is set to groupcast is transmitted:  2> start or restart sl-drx-InactivityTimer for the corresponding Destination Layer-2 ID after the first slot of SCI transmission. |

* Comment from MAC CR rapporteur point of view on this correction
* Section 5.28.2 is the section on the RX UE’s behaviour. So the correction should be reflected in 5.28.~~2~~3 (Behaviour of UE transmitting SL-SCH data).

Q20: Would your company agree with the correction 7 in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes with change | Section 5.28.2 is the section on the RX UE’s behaviour. So the correction should be reflected in 5.28.~~2~~.3 (Behaviour of UE transmitting SL-SCH data). |
| InterDigital | Yes | We are ok with having the change in section 5.28.2, since this section is related to the maintenance of the DRX timers, which is RX UE behavior. |

4.1.8

In section 5.28.2, different places are used for down-selection of cycle/on-duration timer length and inactivity timer length, which is not necessary / comprehensive.

In section 5.28.2, with relocating the down-selection of inactivity timer of groupcast, the inactivity timer starting behaviour for unicast and groupcast are the same except for the difference that “source/destination L2 ID pair” should be replaced with “L2 destination ID”.

Correction for relocating the down-selection of inactivity timer of groupcast:

|  |
| --- |
| 1> if an SL DRX is in Active Time:  2> monitor the SCI (i.e., 1st stage SCI and 2nd stage SCI) in this SL DRX.  2> if the SCI indicates a new SL transmission:  3> if Source Layer-1 ID of the SCI is equal to the 8 LSB of the intended Destination Layer-2 ID and Destination Layer-1 ID of the SCI is equal to the 8 LSB of the intended Source Layer-2 ID and the cast type indicator in the SCI is set to unicast; or  3> if Destination Layer-1 ID of the SCI (i.e., 2nd stage SCI) is equal to the 8 LSB of the intended Destination Layer-1 ID and the cast type indicator in the SCI is set to groupcast:  4> start or restart *sl-drx-InactivityTimer* for the corresponding Source Layer-2 ID and Destination Layer-2 ID pair for unicast or the corresponding Destination Layer-2 ID for groupcast after the first slot of SCI reception. |

* Comment from MAC CR rapporteur point of view on this correction
* Nature of Inactivity timer is different from cycle and ouduration timer. That is, the inactivity timer is a timer that should be started only after receiving the PSCCH/PSSCH from the TX UE. Also, according to RAN2 agreement, RX UE starts inactivity timer based on 2nd SCI information (Layer-1 ID). In other words, considering the down-selection time as SCI reception time in the groupcast is more consistent with the RAN2 agreement. Also, if the RX UE succeeds in receiving the SCI but fails to decode the MAC PDU, the Destination Layer-2 ID cannot be known. RX UE behaviour of selecting the inactivity timer length in advance based on the Destination Layer-2 ID even though the L2 ID is not known is very strange behaviour.

RAN2 agreements:

* For unicast, the RX UE (re)starts the inactivity timer based on information in SCI (SCI1+SCI2). FFS if the MAC layer can stop the inactivity timer.
* For unicast, the RX UE (re)starts the inactivity timer in the first slot after SCI (SCI1+SCI2) reception.
* For GC, when performing the down-selection of the inactivity timer, select the inactivity timer whose inactivity timer length is the largest one (among multiple ones for the corresponding L2 id) as the selected inactivity timer.

Q21: Would your company agree with the correction for relocating the down-selection of inactivity timer of groupcast in R2-2204574?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | No | Nature of Inactivity timer is different from cycle and ouduration timer. That is, the inactivity timer is a timer that should be started only after receiving the PSCCH/PSSCH from the TX UE. Also, according to RAN2 agreement, RX UE starts inactivity timer based on 2nd SCI information (Layer-1 ID). In other words, considering the down-selection time as SCI reception time in the groupcast is more consistent with the RAN2 agreement. Also, if the RX UE succeeds in receiving the SCI but fails to decode the MAC PDU, the Destination Layer-2 ID cannot be known. RX UE behaviour of selecting the inactivity timer length in advance based on the Destination Layer-2 ID even though the L2 ID is not known is very strange behaviour. |
| InterDigital | No | We think the current text in the MAC specification is correct. |

## 4.2 R2-2204575 Miscellaneous correction on user plane aspects for SL DRX OPPO CR

1. In 5.22.1.1, 5.22.1.2, 5.22.1.3.1, 5.22.1.3.2, the reference to section 5.28.1 about the “Active time” definition is wrong since the related definition and UE behaviour is for Tx UE, which is captured in 5.28.X.

2. In 5.22.1.8 the reference to section 5.28.1 about “stop the running sl-drx-onDurationTimer or sl-drx-InactivityTimer” is wrong since the UE behaviour upon reception of SL DRX MAC CE is captured in 5.28.2.

3. In 5.28.2 the reference to section 5.28.1 about the “Active time” definition of Rx UE is wrong since the related definition is captured in 5.28.2.

4. In section 5.22.1.2a, the “remove” and “replace” UE behaviour in case SL DRX is configured and SL DRX is not configured are the same.

5. In section 5.22.1.1, 5.22.1.4.1.2, 5.28.2, the format of “active time” is not aligned with Uu DRX and other places of SL DRX, i.e., it is “Active time” in Uu DRX and other places of SL DRX.

6. In section 5.22.1.5, cancelling condition due to CSI report and DRX command indication for SR triggered by these 2 MAC CEs are captured together with “or”, which will lead to confusion/wrong-cancellation on SR triggered by CSI report is cancelled due to DRX command MAC CE or vice versa.

7. The section number of “Behaviour of UE transmitting SL-SCH Data” should be 5.28.X instead of 5.28.2

* Comment from MAC CR rapporteur point of view on this correction
  + - Corrections seem appropriate.

Q22: Would your company agree with the corrections in R2-2204575?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

## 4.3 R2-2204781 Correction on user plane aspects for SL DRX LG Electronics France CR

4.3.1

At #117 meeting, RAN2 agreed to the following agreement. However, the agreement below was not reflected in the current specification.

- “For unicast, sl-drx-RetransmissionTimer is not started after expiry of sl-drx-HARQ-RTT-Timer when the PSFCH of ACK transmission is dropped.

**Correction:**

|  |
| --- |
| 5.28.2 Behaviour of UE receiving SL-SCH Data  When SL DRX is configured, the Active Time includes the time while:  - *sl-drx-onDurationTimer* or *sl-drx-InactivityTimer* is running; or  - *sl-drx-RetransmissionTimer* is running; or  - period of *sl-LatencyBoundCSI-Report* configured by RRC in case SL-CSI reporting MAC CE is not received; or  - the time between the transmission of the request of SL-CSI reporting and the reception of the SL-SCI reporting MAC CE in case SL-CSI reporting MAC CE is received; or  - Slot associated with the announced periodic transmissions by the UE transmitting SL-SCH Data.  When one or multiple SL DRX is configured, the MAC entity shall:  1> if multiple SL DRX Cycles that are mapped with multiple *SL-QoS-Profiles* of a Destination Layer-2 ID and interested cast type is associated to groupcast and broadcast:  2> select *sl-drx-Cycle* whose length of the *sl-drx-cycle* is the shortest one among multiple SL DRX Cycles that are mapped with multiple *SL-QoS-Profiles* associated with the Destination Layer-2 ID:  2> select *sl-drx-onDurationTimer* whose length of the *sl-drx-onDurationTimer* is the longest one among multiple SL DRX onduration timers that are mapped with multiple *SL-QoS-Profiles* associated with the Destination Layer-2 ID.  1> if an *sl-drx-HARQ-RTT-Timer* expires:  2> if the data of the corresponding Sidelink process was not successfully decoded or if the HARQ feedback (i.e., negative acknowledgement) is not transmitted for unicast due to UL/SL prioritization:  3> start the *sl-drx-RetransmissionTimer* for the corresponding Sidelink process in the first slot after the expiry of *sl-drx-HARQ-RTT-Timer*.  NOTE: For unicast, *sl-drx-RetransmissionTimer* is not started after expiry of *sl-drx-HARQ-RTT-Timer* when the PSFCH of ACK transmission is dropped. |

Q23: Would your company agree with the correction (add NOTE) above of R2-2204781?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

4.3.2

When Rx UE receives SCI in SL unicast, if Source Layer-1 ID of the SCI is equal to the 8 LSB of the intended Destination Layer-2 ID and Destination Layer-1 ID of the SCI is equal to the 16 LSB of the intended Source Layer-2 ID and the cast type indicator in the SCI is set to unicast, the RX UE should start *sl-drx-InactivityTimer* for the corresponding Source Layer-2 ID and Destination Layer-2 ID pair after the first slot of SCI reception. However, the LSB bit has been incorrectly specified in the specification.

Correction:

|  |
| --- |
| 1> if an SL DRX is in Active Time:  2> monitor the SCI (i.e., 1st stage SCI and 2nd stage SCI) in this SL DRX.  2> if the SCI indicates a new SL transmission:  3> if Source Layer-1 ID of the SCI is equal to the 8 LSB of the intended Destination Layer-2 ID and Destination Layer-1 ID of the SCI is equal to the 16 LSB of the intended Source Layer-2 ID and the cast type indicator in the SCI is set to unicast:  4> start or restart *sl-drx-InactivityTimer* for the corresponding Source Layer-2 ID and Destination Layer-2 ID pair after the first slot of SCI reception. |

Q24: Would your company agree with the correction above of R2-2204781?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

## 4.4 R2-2204922 Miscellaneous correction on TS 38.321 for SL DRX Huawei, HiSilicon CR

1. In RAN2 #117, a WA was reached as follows:

Working assumption: if there is no SL grant in the SL DRX active time of the destination that has data to be sent, trigger resource reselection.

However, in 5.22.1.2, the trigger condition is SL grants are not in SL DRX Active time of any destination that has data to be sent, which is not aligned with above WA. Note that SL grants are not in SL DRX Active time of any destination that has data to be sent is another candidate trigger of resource selection which is not agreed in [POST116bis-e][705].

**Correction:**

|  |
| --- |
| 5.22.1.2 TX resource (re-)selection check  If the TX resource (re-)selection check procedure is triggered on the selected pool of resources for a Sidelink process according to clause 5.22.1.1, the MAC entity shall for the Sidelink process:  1> if PSCCH duration(s) and 2nd stage SCI on PSSCH for all transmissions of a MAC PDU of any selected sidelink grant(s) are not in SL DRX Active time as specified in clause 5.28.1 of the destination that has data to be sent; or |

Q25: Would your company agree with the correction above in R2-2204922?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

2. In 5.22.1.3.1, if previous SL grant is not in SL DRX Active time of the destination that has data to be sent, UE can use re-transmission occasion for initial transmission. However, it is not aligned with the agreement in RAN2 #117:

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.

**Correction:**

|  |
| --- |
| 5.22.1.3.1 Sidelink HARQ Entity  The MAC entity includes at most one Sidelink HARQ entity for transmission on SL-SCH, which maintains a number of parallel Sidelink processes.  The maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 16. A sidelink process may be configured for transmissions of multiple MAC PDUs. For transmissions of multiple MAC PDUs with Sidelink resource allocation mode 2, the maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 4.  A delivered sidelink grant and its associated Sidelink transmission information are associated with a Sidelink process. Each Sidelink process supports one TB.  For each sidelink grant, the Sidelink HARQ Entity shall:  1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or  1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in an *sl-PeriodCG* of the configured sidelink grant; or  1> if the sidelink grant is a dynamic sidelink grant or selected sidelink grant and no MAC PDU has been obtained in the previous sidelink grant when PSCCH duration(s) and 2nd stage SCI on PSSCH of the previous sidelink grant is not in SL DRX Active time as specified in clause 5.28.1 of any destination that has data to be sent: |

Q26: Would your company agree with the correction above in R2-2204922?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

3. In 5.22.1.3.1, it is captured for selected sidelink grant, if previous SL grant is not in SL DRX Active time of the destination that has data to be sent, UE can use re-transmission occasion for initial transmission. Therefore, the duplicated description in 5.22.1.1 can be deleted.

* Rapporteur comment
* This proposal is the same issue as Correction 2 (R2-2204574) in 4.1, and is dealt with by discussing the corresponding CR.

4. In 5.22.1.3.1, if a DG or CG SL grant for initial transmission is not in SL active time of the destination that has data to be sent, ignore SL grant. However, this case can reuse legacy procedure for the case that no MAC PDU is obtained and thus no specification impact is needed.

* Rapporteur comment
* This proposal is the same issue as Correction 4 (R2-2204574) in 4.1, and is dealt with by discussing the corresponding CR.

5. In 5.22.1.4.1.2, when selecting a destination associated with sidelink discovery, the selected destination should be ensured to be in SL active time as we agreed during RAN2#116.

- RAN2 confirms Rel-17 SL-DRX design can be reused for L3 relay-related ProSe discovery without additional specific solution discussion/specification effort (by applying SL default-DRX configuration).

Correction:

|  |
| --- |
| 5.22.1.4.1.2 Selection of logical channels  The MAC entity shall for each SCI corresponding to a new transmission:  1> if *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon* is configured according to TS 38.331 [5]:  2> if the new transmission is associated with a sidelink grant in *sl-DiscTxPoolSelected* or *sl-DiscTxPoolScheduling* configured in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*:  3> select a Destination associated with sidelink discovery as specified in TS 23.304 [26], that is in the SL active time for the SL transmission occasion if SL DRX is applied for the destination, and having at least one of the logical channel with the highest priority, among the logical channels that satisfy all the following conditions for the SL grant associated to the SCI:  4> SL data is available for transmission; and  4> *SBj* > 0, in case there is any logical channel having *SBj* > 0; and  4> *sl-configuredGrantType1Allowed*, if configured, is set to *true* in case the SL grant is a Configured Grant Type 1; and  4> *sl-AllowedCG-List*, if configured, includes the configured grant index associated to the SL grant.  2> else:  3> select a Destination associated with one of unicast, groupcast and broadcast (excluding the Destination(s) associated with sidelink discovery as specified in TS 23.304 [26]), that is in the SL active time for the SL transmission occasion if SL DRX is applied for the destination, and having at least one of the MAC CE and the logical channel with the highest priority, among the logical channels that satisfy all the following conditions and MAC CE(s), if any, for the SL grant associated to the SCI: |

Q27: Would your company agree with the correction above in R2-2204922?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Follow majority view |  |
| InterDigital | No | It would be best to down-prioritize changes related to inter-WI dependence for now. |

6. Fix some editorials.

- The editorial corrections will be merged rapporteur CR.

## 4.5 R2-2204948 Correction on the SL DRX Inactivity Timer Maintenance CATT CR

* Rapporteur comment
* This correction including discussion paper (R2-2204947) is the same issue as Correction (R2-2204574) in 4.1.8, and is dealt with by discussing the corresponding CR.

## 4.6 R2-2204950 Correction on the SL DRX Inactivity Timer Maintenance CATT CR

Correction 1.

The condition to start retransmission timer is “if the data of the corresponding Sidelink process was not successfully decoded or if the HARQ feedback (i.e., negative acknowledgement) is not transmitted for unicast due to UL/SL prioritization”. But in our understanding, upon the SL DRX HARQ RTT timer expiry, the only condition to start the SL DRX retransmission timer is the data of the corresponding sidelink process was not successfully decoded no matter the HARQ feedback is transmitted or not.

* Rapporteur comment
* This correction is the same issue as Correction (R2-2204574) in 4.1.6, and is dealt with by discussing the corresponding CR.

Correction 2.

The start of SL DRX retransmission timer is placed not together with the other timers.

* Comment from MAC CR rapporteur point of view on this correction
* It’s ok to put the timer maintenance descriptions of all SL DRX timers together in the same part of section 5.28.2 in TS38.321 without other correction (i.e., correction 1).

Q28: Would your company agree with the correction 2 (i.e., start of SL DRX retransmission timer is placed together with the other timers.) without other correction (i.e., correction 1: modify the condition.) in R2-2204950?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | No | This change seems mostly cosmetic, and perhaps can be down-prioritized. |

## 4.7 R2-2205107 Correction on Destination ID index in SL BSR ZTE Corporation, Sanechips CR

For SL BSR reporting, UE will include the destination index in the SL BSR. The destination index is set to the one index corresponding to a destination ID list reported in SUI.

When it comes into SL relay, except legacy R16 destination ID list(i.e., *sl-TxResourceReqList-r16*), two new ID list(*sl-TxResourceReqListDisc-r17* and sl-*TxResourceReqListCommRelay-r17*) are added. And all these ID lists have same maximum(i.e. maxNrofSL-Dest-r16).

In this case, UE does not know how to set destination index in the SL BSR, since the total number of DST ID in these ID list may exceed the upper bound of destination index of SL BSR. Additionally, since more than one lists are reported to gNB, UE does not know the order of these list when setting the destination index of of SL BSR.

**Correction:**

|  |
| --- |
| 6.1.3.33 Sidelink Buffer Status Report MAC CEs  Sidelink Buffer Status Report (SL-BSR) MAC CEs consist of either:  - SL-BSR format (variable size); or  - Truncated SL-BSR format (variable size).  SL-BSR and Truncated SL-BSR MAC control elements consist of one Destination Index field, one LCG ID field and one corresponding Buffer Size field per reported target group.  The SL-BSR formats are identified by MAC subheaders with LCIDs as specified in in Table 6.2.1-2.  The fields in the SL-BSR MAC CE are defined as follows:  - Destination Index: The Destination Index field identifies the destination. The length of this field is 5 bits. The value is set to one index corresponding to *SL-DestinationIdentity* associated to same destination reported in *SL-TxResourceReqList*. The value is indexed sequentially from "0" in the same ascending order of *SL-DestinationIdentity* in *sl-TxResourceReqList-r16, sl-TxResourceReqListDisc-r17, sl-TxResourceReqListCommRelay-r17* as specified in TS 38.331 [5], If multiple such lists are reported, the value is indexed sequentially across all the lists in the same order as specified in TS 38.331[5];  - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) whose SL buffer status is being reported. The length of the field is 3 bits;  - Buffer Size: The Buffer Size field identifies the total amount of data available according to the data volume calculation procedure in TSs 38.322 [3] and 38.323 [4] across all logical channels of a logical channel group of a destination after the MAC PDU has been built (i.e. after the logical channel prioritization procedure, which may result the value of the Buffer Size field to zero). The amount of data is indicated in number of bytes. The size of the RLC headers and MAC subheaders are not considered in the buffer size computation. The length of this field is 8 bits. The values for the Buffer Size field are shown in Table 6.1.3.1-2, respectively. For the Truncated SL-BSR format the number of Buffer Size fields included is maximised, while not exceeding the number of padding bits. |

Q29: Would your company agree with the correction above in R2-2205107?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

## 4.8 R2-2205180 Corrections of 38.321 on TX resource selection Ericsson CR

**Issue 1:**

A pre-Rel.17 UE served by a Rel.17 gNB may not be configured with DRX. This needs to be captured in Note 1 in clause 5.7.

Correction:

|  |
| --- |
| 5.7 Discontinuous Reception (DRX)  The MAC entity may be configured by RRC with a DRX functionality that controls the UE's PDCCH monitoring activity for the MAC entity's C-RNTI, CI-RNTI, CS-RNTI, INT-RNTI, SFI-RNTI, SP-CSI-RNTI, TPC-PUCCH-RNTI, TPC-PUSCH-RNTI, TPC-SRS-RNTI, AI-RNTI, SL-RNTI, SLCS-RNTI and SL Semi-Persistent Scheduling V-RNTI. When using DRX operation, the MAC entity shall also monitor PDCCH according to requirements found in other clauses of this specification. When in RRC\_CONNECTED, if DRX is configured, for all the activated Serving Cells, the MAC entity may monitor the PDCCH discontinuously using the DRX operation specified in this clause; otherwise the MAC entity shall monitor the PDCCH as specified in TS 38.213 [6].  NOTE 1: If Sidelink resource allocation mode 1 is configured by RRC for a pre-Rel. 17 UE, a DRX functionality is not configured. |

Q30: Would your company agree with the correction above in R2-2205180?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| InterDigital | Yes | We had similar text in release 16 specification to indicate that a SL UE could not be configured with Uu DRX. |

**Issue 2:**

In several places, the wording “from the resource pool which occur within the SL DRX active time as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX active time” are used. However, RAN2 has agreed that how to select destinaion UE is left to TX UE implementation, therefore, the activate time determined by the TX UE may consider time information of one or multiple destination UEs. Therefore, “of the destination UE selected” should be removed.

**Correction (part of corrections):**

|  |
| --- |
| 5> randomly select the time and frequency resources for one transmission opportunity from the resource pool which occur within the SL DRX active time as specified in clause 5.28.2 for indicating to the physical layer the SL DRX active time above, 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. |

Q31: Would your company agree with the corrections (the text “of the destination UE selected” is removed in a couple of places.) in R2-2205180?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | No |  |
| InterDigital | No | The current text in the MAC specification is clearer and the change adds ambiguity with no advantage. |

**Issue 3:**

Clause 5.22.1.8 is not needed; it can be removed. Give that UE actions upon reception of SL DRX command are already captured in clause 5.28.

**Correction:**

|  |
| --- |
|  |

Q32: Would your company agree with the correction above of R2-2205180?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Follow majority view |  |
| InterDigital | Yes |  |

## 4.9 R2-2205181 Corrections of 38.321 on SL grant reception Ericsson draftCR

**Issue 1:**

A Rel.17 UE served by a Rel.17 gNB may perform LTE sidelink transmission for V2X sidelink communication. When resource allocation mode 1 is configured, the gNB may use PDCCH to activate/deactivate the semi-persistently scheduled sidelink transmission. In this case PDCCH indicating activation of sidelink SPS shall be considered to indicate a new transmission similar as activation of UL SPS or activation of sidelink configured grant type 2.

**Correction:**

|  |
| --- |
| 5.7 Discontinuous Reception (DRX)  < Unmodified parts omitted >  2> if the PDCCH indicates a new transmission (DL, UL or SL) on a Serving Cell in this DRX group:  3> start or restart *drx-InactivityTimer* for this DRX group in the first symbol after the end of the PDCCH reception.  NOTE 3a: A PDCCH indicating activation of SPS, configured grant type 2, sidelink SPS, or configured sidelink grant of configured grant Type 2 is considered to indicate a new transmission. |

Q33: Would your company agree with the correction above of R2-2205181?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

**Issue 2:**

RAN2 agreed that

*For mode-1 DG and mode-2 grant, 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.*

This agreement has been captured in clause 5.22.1.3.1.

Therefore, below text in clause 5.22.1.1 (as highlited) is not needed.

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

……

5> if selected resource for initial transmission occasion is not in the SL DRX Active time as specified in clause 5.28.1 of any destination that has data to be sent:

6> use retransmission occasion(s) for initial transmission of PSCCH and PSSCH.

* Rapporteur comment
* This proposal is the same issue as Correction **2** (R2-2204574) in 4.1, and is dealt with by discussing the corresponding CR.

**3. Issue 3**

The below RAN2 agreement

*For mode-1 DG and mode-2 grant, 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.*

has been captured by the below texts as highlighted in clause 5.22.1.3.1

1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or

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; or

1> if the sidelink grant is a dynamic sidelink grant or selected sidelink grant and no MAC PDU has been obtained in the previous sidelink grant when PSCCH duration(s) and 2nd stage SCI on PSSCH of the previous sidelink grant is not in SL DRX Active time as specified in clause 5.28.1 of the destination that has data to be sent:

however, the wording is not accurate. The RAN2 agreement is only applicable to the case where the previous sidelink grant and the current sidelink grant are used for transmission of the same TB.

* Rapporteur comment
* This proposal is the same issue as Correction **3** (R2-2204574) in 4.1, and is dealt with by discussing the corresponding CR.

## 4.10 R2-2205622 Aligning Parameter names for UC GC and BC Lenovo CR

The MAC entity may be configured by RRC with an SL DRX functionality that controls the UE's SCI (i.e., 1st stage SCI and 2nd stage SCI) monitoring activity for unicast, for groupcast and broadcast. The derivation/ determination and naming of DRX configuration parameters are different in RRC but MAC implementation can use just a single name as long as it is clarified that DRX configuration IE names for different cast types are used under the same name in MAC specification.

**Correction:**

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| --- |
| 5.28 Sidelink Discontinuous Reception (DRX)  5.28.1 General  The MAC entity may be configured by RRC with an SL DRX functionality that controls the UE's SCI (i.e., 1st stage SCI and 2nd stage SCI) monitoring activity for unicast, for groupcast and broadcast. When using SL DRX operation, the MAC entity shall also monitor SCI (i.e., 1st stage SCI and 2nd stage SCI) according to requirements found in other clauses of this specification.  RRC controls Sidelink DRX operation by configuring the following parameters:  - *sl-drx-onDurationTimer*: the duration at the beginning of an SL DRX cycle named *sl-DRX-GC-BC-OnDurationTimer* for GC BC communication;  - *sl-drx-SlotOffset*: the delay before starting the *sl-drx-onDurationTimer*;  - *sl-drx-InactivityTimer* (except for the broadcast transmission): the duration after the first slot of SCI (i.e., 1st stage SCI and 2nd stage SCI) reception in which an SCI indicates a new SL transmission for the MAC entity, named *sl-DRX-GC-InactivityTimer* for GC BC communication;  - *sl-drx-RetransmissionTimer* (per Sidelink process except for the broadcast transmission): the maximum duration until an SL retransmission is received, named sl-DRX-GC-RetransmissionTimer for GC communication;  - *sl-drx-StartOffset*: the slot where the SL DRX cycle starts;  - *sl-drx-Cycle*: the Sidelink DRX cycle, named *sl-DRX-GC-BC-Cycle* for GC BC communication;  - *sl-drx-HARQ-RTT-Timer* (per Sidelink process except for the broadcast transmission): the minimum duration before an SL HARQ retransmission is expected by the MAC entity. |

Q34: Would your company agree with the correction above of R2-2205622?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | No | The current text is already sufficiently clear. |

## 4.11 R2-2205910 Corrections on HARQ RTT Handling in MAC Specification InterDigital, Ericsson, Apple draftCR

When the UE determines the HARQ RTT timer from the SCI, the behavior of the UE should be specified in normative text to avoid mismatch between the TX and RX UE. This is already the case for adding the periodic resource reservations in the active time.

However, for HARQ RTT derivation from the SCI, the MAC specification currently uses a note only.

**Correction:**

|  |
| --- |
| 5.28.2 Behaviour of UE receiving SL-SCH Data  ~  2> if the SCI indicates an SL transmission:  3> if the resource(s) for one or more retransmission opportunities is scheduled in the SCI  4> derive the *sl-drx-HARQ-RTT-Timer* from the retransmission resource timing of the first retransmission resource in the SCI  3> else:  4> use the *sl-drx-HARQ-RTT-Timer* configured by upper layers  3> if PSFCH resource is not configured for the SL grant associated to the SCI:  4> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the slot following the end of PSSCH transmission (i.e., currently received PSSCH).  3> if PSFCH resource is configured for the SL grant associated to the SCI:  4> if HARQ feedback is enabled by the SCI and the cast type indicator in the SCI is set to unicast; or  4> if HARQ feedback is enabled by the SCI and the cast type indicator in the SCI is set to groupcast and positive-negative acknowledgement is selected;  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH transmission carrying the SL HARQ feedback; or  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH resource for the SL HARQ feedback when the SL HARQ feedback is not transmitted due to UL/SL prioritization;  4> if HARQ feedback is enabled by the SCI and the cast type indicator in the SCI is set to groupcast and negative-only acknowledgement is selected;  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH transmission carrying the SL HARQ feedback; or  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH resource for the SL HARQ feedback when the SL HARQ feedback is not transmitted due to UL/SL prioritization; or  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the first slot after the end of the corresponding PSFCH resource for the SL HARQ feedback when the SL HARQ feedback is a positive acknowledgement.  4> if HARQ feedback is disabled by the SCI and the resource(s) for one or more retransmission opportunities is not scheduled in the SCI:  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the slot following the end of PSFCH resource.  4> if HARQ feedback is disabled by the SCI and the resource(s) for one or more retransmission opportunities is scheduled in the SCI:  5> start the *sl-drx-HARQ-RTT-Timer* for the corresponding Sidelink process in the slot following the end of PSSCH transmission (i.e., currently received PSSCH). |

Q35: Would your company agree with the correction above of R2-2205910?

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| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

## 4.12 R2-2205911 Corrections on Inactivity Timer Resetting for Groupcast InterDigital draftCR

In the current MAC specification, inactivity timer is reset upon reception of a new transmission associated with a SRC/DEST L2 ID. Groupcast communication uses SL inactivity timer. Specifically, if a UE performs a groupcast transmission to a L2 destination ID, all UEs that are receiving the transmission associated with that L2 destination ID should reset their SL inactivity timer and be able to receive additional groupcast transmissions. This extends the period of time where the group can communicate. However, extending this period should also apply to the UE performing the transmission. Currently, a UE that performs groupcast transmission to a L2 destination ID operating in DRX does not reset its SL inactivity timer.

Add the resetting of the SL inactivity timer for a L2 destination ID upon transmission by a UE to that L2 destination ID.

**Correction:**

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| --- |
| 5.28.2 Behaviour of UE receiving SL-SCH Data  ~   1. if the cast type indicated by upper layer is groupcast and a new transmission is performed for a Destination Layer-2 ID:   2> start or restart *sl-drx-InactivityTimer* for the Destination Layer-2 ID after the first slot of SCI transmission  1> if an SL DRX Command MAC CE is received for the Source Layer-2 ID and Destination Layer-2 ID pair of a unicast:  2> stop *sl-drx-onDurationTimer* for the Source Layer-2 ID and Destination Layer-2 ID pair of a unicast;  2> stop *sl-drx-InactivityTimer* for the Source Layer-2 ID and Destination Layer-2 ID pair of a unicast. |

Q36: Would your company agree with the correction above of R2-2205911?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes with change | Section 5.28.2 is the section on the RX UE’s behaviour. So the correction should be reflected in 5.28.~~2~~.3 (Behaviour of UE transmitting SL-SCH data). |
| InterDigital | Yes | We are also fine to leave to section 5.28.2. Note – this is the same issue as in section 4.1.7. |

## 4.13 R2-2205912 Corrections on Active Time Definition at the TX UE InterDigital draftCR

The TX UE determines whether transmission to an RX UE configured in DRX can be performed by maintaining the active time associated with an RX UE in 5.28.2. This includes both the current active time and future active time.

This current and future active time is defined in 5.28.2 based on the SL DRX timers only (on-duration, inactivity, and retransmission timers). However, at the RX UE, active time includes also the slots associated with announced periodic transmissions by the TX UE, and the time following CSI request received by the TX UE.

Section 5.28.2 is incorrectly numbered (should be 5.28.3).

Include the active times associated with periodic transmissions and CSI reporting window in the definition of the current and future active time at the TX UE.

**Correction:**

|  |
| --- |
| 5.28.3 Behaviour of UE transmitting SL-SCH Data  The UE transmitting SL-SCH Data should keep aligned with its intended UE receiving the SL-SCH Data regarding the SL DRX Active time as specified in clause 5.28.1.  Furthermore, the UE transmitting SL-SCH Data determines the SL DRX active time based on  - SL DRX timers that are running (e.g., *sl-drx-onDurationTimer*, *sl-drx-InactivityTimer*, *sl-drx-RetransmissionTimer*) or will be running in the future (e.g., *sl-drx-onDurationTimer*, *sl-drx-InactivityTimer*, *sl-drx-RetransmissionTimer*) at the UE(s) receiving SL-SCH data.  - the slot(s) associated with periodic transmission(s) that have been announced by the UE in SCI  - the time between reception of CSI request from the intended UE and transmission of a CSI report, upto a maximum of *sl-LatencyBoundCSI-Report*  When determining the active time from the SL DRX timers, the UE may select resource for the initial transmission of groupcast within the time when *sl-drx-onDurationTimer* or *sl-drx-InactivityTimer* of the destination is running.  NOTE: A UE may assume that a resource for retransmission is in the active time if an initial transmission causes the *sl-drx-RetransmissionTimer* to be started at the receiving UE. |

Q37: Would your company agree with the correction above of R2-2205912?

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| --- | --- | --- |
| **Company** | **Yes,**  **Yes with change,**  **No** | **Detailed Comments** |
| LG | Yes |  |
| InterDigital | Yes |  |

# Reference

[1]