**Proposal for email thread topics for Rel-16 5G V2X maintenance**

Thread #1

* Issue PS-1: PSSCH DMRS mapping

Thread #2

* Issue M1-1-1: SL HARQ-ACK reporting when SL FB is not used (considering LS in R1-2104559)

Thread #3

* Issue M1-2-1: Value of n\_CI

Thread #4

* Issue M2-5: HARQ RTT time gap capturing issue in MAC (considering LS in R1-2104559)

Separate threads for TP capturing agreements made in previous meetings and preparation of reply LS

Thread #A

* Issue M1-4: TPs corresponding to agreements in previous meetings (Agreement/LS from RAN1#104, reply LS received in R1-2104160)

Thread #B

* Issue M2-1: TP to implement the agreement from [104b-e-NR-5G\_V2X-03]

Thread #C

* Issue PP-1: TP for multiplexing SL HARQ-ACK reports on a PUSCH

Thread #D

* LS reply to R1-2104559 taking into account the outcome of Thread #2 and Thread #4.

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| Company | Comments |
| LG Electronics  | From our perspective, it is doubtful that Issue PS-1 is really an essential one needed to be resolved at this late timing of maintenance phase. So, our preference is to remove it. In addition, when discussing Issue M1-1-1, we should limit the scope of email discussion to the contents (i.e., how to report ACK/NACK via PUCCH when using CG resources) mentioned in the RAN2 LS of R1-2104559. In other words, it should be avoided to discuss an optimization relevant to other aspects (e.g., how to report ACK/NACK via PUCCH when using DG resources) together.  |
| ZTE, Sanechips | OK with the proposal |
| NTT DOCOMO | We agree with LGE that it seems that PS-1 is not an essential one. Even if some discussions are needed, it should be just an editorial one. No need to consume one valuable thread for this topic.Instead of PS-1, we believe that M1-1-2 should be discussed. As presented in our contribution x5680, RAN1 spec does not have text corresponding to text in RAN2 spec that DG resource can be skipped. This is not an optimization, but essential one. (If RAN1 conclusion is no DG skip and to send an LS to RAN2, then it is also fine in our understanding. At least RAN1 work is necessary.)We are OK with the remaining part. |
| Ericsson | We do not think an email thread is needed for PS-1. If there is wide support, it is probably enough to have a CR/TP thread.We are supportive of discussing the other 3 threads along with the TP threads. |
| NEC | For PS-1, we believe "allocated " and "available" leads to different understandings in DMRS mapping and current wording "allocated" indeed cause ambiguity. As compromise, we can accept to move this issue to CR/TP thread as suggested by Ericsson.However, if one think current "allocated" is clear enough and has no ambiguity, at least from our perspective, discussion in a thread is needed to clarify "allocated" means "available" for sidelink here, e.g., conclusion in chairman note. Other threads are OK for us. |
| Samsung | We are O.K with the proposals in general. However, we think that Thread #D can cover Thread #2 and #4. How about to reduce the number of email threads? |
| OPPO | For issue PS-1, tend to agree with most of other companies that it should be treated as an editorial correction which can be suggested to the spec editor at the end of meeting or as part of an existing TP thread. For thread #2-4 and #A-D, we are generally fine. |
| CATT，GOHIGH | We don’t think PS-1 is necessary, since the “allocated for PSSCH transmission” which has excluded the resources used for PSCCH transmission.Others are fine for us.  |
| Huawei, HiSilicon | Thread #1PS-1 is non-essential because current spec is already clear. TS38.213 section 8.1.2.2 clearly states that "*If a PSSCH scheduled by a PSCCH would overlap with resources containing the PSCCH, the resources corresponding to a union of the PSCCH that scheduled the PSSCH and associated PSCCH DM-RS are not available for the PSSCH.*" That is, the PSCCH and PSCCH DMRS are excluded from PSSCH resources. With this, the current wording “allocated” does not cause PSSCH DMRS RE mapping into either PSCCH or PSCCH DMRS REs, and therefore changing to “available” changes nothing.→ No discussion is necessary. We suggest having no thread for this topic.→ It can take issue M2-2 instead, which the mode 2 FL suggested can be discussed.To be clear, PS-0 will be reported by Jeongho directly to the editor, is that right? It might be worth adding PS-2 to that list of issues, as it does not seem to need any underlying technical decision. If PS-0 handling is pending a decision, then we suggest putting it as Thread #1 instead.Regarding LS R1-2014559 reply.We see why there are 3 threads for this (#2, #4, #D), but it is rather a lot of e-paperwork for one LS. Can we take both issues and the reply drafting into a single thread? At least, it will reduce the number of emails and the potential loss of cross-referencing between the different threads as the work proceedsThe other threads on previous agreements, etc. look ok. |
| vivo | **Thread #1:**Actually, we don’t think the change of PS-1 is needed, nor the reason is correct. Firstly, it is correct and beneficial to keep the same term “allocated” between Uu and SL. Moreover, in the case “PDSCH mapping type A” + “CORESET after the third symbol”, it is already possible in Uu that the PDCCH and PDSCH DMRS are FDMed.Instead of PS-1, we suggest to discuss M2-4 or M1-1-5. M1-1-5 is a necessary clarification as assessed by FL.M2-4 is not an optimization; actually, it is to make the UE behaviors aligned between mode-1 and mode-2, according to the following mode-1 agreement:Agreements:* If the time between PSFCH reception and next scheduled PSCCH/PSSCH retransmission is less than Tprep + delta, the UE is allowed to drop the PSCCH/PSSCH retransmission with SL HARQ feedback enabled.

**Thread #A:**We are wondering whether M1-2-2 can be handled together in this thread, as it is to capture the missing parts of the following agreements in RAN1#102:Agreements:* If the DCI size budget is not exceeded, no alignment of DCI format 3\_0 / 3\_1 with other NR DCI formats is performed.
* If the DCI size budget is exceeded, DCI format 3\_0 / 3\_1 is zero-padded until the size is equal to that of the next large Uu DCI format (in size).
* The UE does not expect that the following two conditions happen simultaneously:
	+ The DCI size budget is exhausted
	+ DCI format 3\_0 / 3\_1 is larger than all other configured DCI formats.
* Note: the DCI size budget is performed for Uu DCI formats first, before the considerations for DCI format 3\_0/3\_1 as listed in the above bullets

We are fine with other threads. |
| NEC-2 | Thank you for the discussion. Regarding Huawei's comment. Yes, our intention is also referring to TS 38214 section 8.1.2.2 which describe the "not available" resource. So we propose to refer to 38214 to eliminate the ambiguity between "allocated" and "available".BTW, do you think editorial correction is necessary like: "*If a PSSCH scheduled by a PSCCH would overlap with resources containing the PSCCH, the resources corresponding to a union of the PSCCH that scheduled the PSSCH and associated PSCCH DM-RS are not available for the PSSCH and associated PSSCH DM-RS*."Regarding vivo's comment, the intention of change is to avoid PSSCH DMRS overlap with PSCCH. We agree the principle to try to keep same terms between UU and SL. However, in our view, "allocated" in DL DMRS mapping includes the "not available" resources, that's why TS 38214 section 5.1.4 captures "*A UE is not expected to handle the case where PDSCH DM-RS REs are overlapping, even partially, with any RE(s) not available for PDSCH*." Hence, as a comment understanding, term "allocated" in sidelink 211 doesn’t include "not available" resources, then the meaning of "allocated" for DL and SL is not consistent. So, we think some changes are needed. |
| Apple | 1. We think 3 threads (Threads 2, 4 and D) is too much to discuss the issues related to one LS. We could merge to 1 or 2 threads.
2. Like some other companies, we also think the email thread for PS-1 is not necessary. It might be treated as an editorial correction.
3. Instead, we think the issue M2-2 or PP-2 could be discussed. Although the issue M2-2 has been discussed without consensus, we think this issue still needs to be addressed to clarify the specifications. The issue PP-2 is related to the new agreement made in last RAN1 meeting on SL PUCCH multiplexing with PUSCH. Since it was agreed that SL PUCCH can only be multiplexed on PUSCH with priority index 0, it is necessary to revisit the priority rule between SL transmission and PUSCH with priority index 0 carrying SL PUCCH. The high priority SL PUCCH carried on PUSCH may have time overlap with SL transmissions. Although SL PUCCH has higher priority than SL transmissions, the SL PUCCH may still be unfortunately dropped as long as SL transmission has priority value less than sl-PriorityThreshold.
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**Summary of inputs**

* To be summarized

**Topics in each FL summary**

**Physical layer structure**

***Issue#PS-0: Whether/how to capture in the specifications will be discussed in Editor CR phase.***

* [1, ETRI]: Correct reference section numbers for CSI-RS/DM-RS transmissions in 214
* [4, Huawei, HiSilicon]: (PSSCH DMRS time domain OCC) Delete the last coulum of Table 8.4.1.1.2-2 in 211to make l^' for the time domain OCC of PSSCH DM-RS only equal to 0.
* [4, Huawei, HiSilicon]: (PSSCH DMRS parameter) λ in Table 8.4.1.1.2-2 in 211 is changed to Δ.

***Issue#PS-1***: PSSCH DMRS mapping

* Change from “allocate” to “available”
* [2, NEC]

***Issue#PS-2***: SCS offset in SL BWP and UL BWP

* Change the definition of sidelink offset $k\_{0}^{μ}$ used in OFDM baseband signal generation
* TP for Clause 5.3.1 for 211 is

 $μ\_{0}$ is the largest $μ$ value among the subcarrier spacing configurations by the higher-layer parameter *scs-SpecificCarrierList* for uplink or downlink, and by the higher-layer parameter *sl-SCS-SpecificCarrierList* for sidelink.

* [3, Sharp]

***Issue#PS-3***: Clarifying multiple PSFCH transmission

* It may need to fix the description in simultaneous PSFCH transmission/reception.
* [3, Sharp]
* This issue may be categorized as physical layer procedure.

**Synchronization**

Issue SY-1: NR SL-TDD-Config in the coverage of eNB

Issue SY-2: Indication of the non-TDD case in sl-TDD-Config

Issue SY-3: Clarification of the notation of “$u\_{slots}^{SL}$”

**Mode 1**

Issue M1-1: SL HARQ-ACK reports to gNB

* M1-1-1: SL HARQ-ACK reporting when SL FB is not used (see CATT (P1-P3), OPPO (Section 2), Ericsson)
	+ This topic is related to Q1 in the LS from RAN2 (R1-2104559) which is discussed in some contributions (see LGE (P2))
* M1-1-2: SL HARQ-ACK reporting when the UE does not perform SL transmission on the resources provided by a DG (see Fujitsu (P1), DCM (TP1))
* M1-1-3: SL HARQ-ACK reporting when multiple pools are configured (see vivo (TP3), ZTE (P2), ASUSTeK (TP1))
* M1-1-4: SL HARQ-ACK reporting in an incomplete PSFCH period (see vivo (TP4), ZTE (P1))
* M1-1-5: Aspects related to PUCCH power control (see vivo (TP5))
* M1-1-6: k>0 in offset between PSFCH and HARQ-ACK reporting (see Sharp (TP3))

Issue M1-2: DCI-related aspects

* M1-2-1: Value of n\_CI (see vivo (TP1))
* M1-2-2: DCI size alignment (see vivo (TP2))
* M1-2-3: Configuration index in DCI format 3\_0 for SL-CS-RNTI for retransmissions (see ASUSTeK (TP5), Sharp (TP1))
* M1-2-4: Search space overlapping between SL and Uu in the same carrier (LGE (P1))

Issue M1-3: Editorial corrections

* 38.213
	+ Clause 10.2A: clarification of the CG validated (ASUSTeK (TP4))
	+ Clause 16.5: Correct “One HARQ-ACK information bit” (Sharp (TP4))
		- FL assessment: The correction seems reasonable but it was discussed earlier without consensus.
* 38.214
	+ Clause 8.1.2: correct reference (ASUSTeK (TP3))
	+ Clause 8.1.2.1:
		- Indicate how the “Configuration index” field is set (see ZTE (P5), ASUSTeK (TP3))
		- RRC parameter name alignment *timeGapFirstSidelinkTransmission* (ASUSTeK (TP3))
	+ Clause 8.4.1.2.2 typo (see OPPO (TP3))

Issue M1-4: TPs corresponding to agreements in previous meetings

* TS 38.213 Clause 16.5: Agreement/LS from RAN1#104, reply LS received in R2-2104463 (see vivo (TP6), ZTE (P4), Nokia+NSB (P1), DCM (TP2))

**Mode 2**

Issue M2-1 – TP to implement the agreement from [104b-e-NR-5G\_V2X-03]

Issue M2-2 – Resource exclusion/selection for multiple transport blocks

Issue M2-3 – Correction to step 6) to include slots within Tproc0

Issue M2-4 – Introduce a dropping condition when HARQ RTT time gap is not met

Issue M2-5 – HARQ RTT time gap capturing issue in MAC – related to LS R1-2104559

Issue M2-6 – In TS 38.214, the subscripts of the notations $t'\_{m+q×P\_{rsvp\\_RX}^{'}}^{SL}$ and $R\_{x,y+j×P\_{rsvp\\_TX}^{'}}$should be changed into $t'\_{mod(m+q×P\_{rsvp\_{RX}}^{'},T^{'}\_{max})}^{SL}$ and $R\_{x,mod(y+j×P\_{rsvp\\_TX}^{'},T^{'}\_{max})} $respectively

Issue M2-7 – Exclude the slots with PSFCH when sl-LengthSymbols≤9 in the identification of candidate resources in the sensing procedure

Issue M2-8 – Clarification on timing relation between re-evaluation moment and initial selection moment

**Physical layer procedure**

Issue PP-1: TP for multiplexing SL HARQ-ACK reports on a PUSCH

* Huawei [R1-2104235], CATT [R-12104478], vivo [R1-2105464], Ericsson [R1-2105895], LG [R1-2105291], Apple [R1-2105082], DCM [R1-2105681]

Issue PP-2: Prioritization rule between PUSCH carrying SL HARQ-ACK reports and SL TX and/or RX

* Fujitsu [R1-2102720], Apple [R1-2105082]

Issue PP-3: Editorial corrections

* Value of sl-PSFCH-RB-Set
	+ Huawei [R1-2104235]
* Applicable condition of using sl-P0-PSSCH-PSCCH
	+ Qualcomm [R1-2104649]
* Replacement of “a serving cell” with “a carrier”
	+ DCM [R1-2105681]
* Reference correction
	+ DCM [R1-2105681]

**QoS**

Issue QS-1: UE behaviour if highest CBR in CBR range configuration is less than 100 %