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

Thread #1

* Issue SY-1: Timing misalignment between eNB/gNB, gNB/gNB
* Issue PS-1: Logical or physical slots in RS sequence generation and mapping

Thread #2

* Issue M1-1-1: dci-FormatsExt vs dci-FormatsSL

Thread #3

* Issue M1-2-1: For Type 1, the number of PSSCH slots associated with the same PSFCH slot could be smaller than the PSFCH resource period
* Issue M1-2-2: How to operate with multiple resource pools with different PSFCH periods

Thread #4

* Issue M2-1: Infinite loop due to excessive resource exclusion in step 5)
* Issue M2-2: Resource exclusion/selection for multiple transport blocks

Thread #5

* Issue PP-1: How SL HARQ-ACK report is piggybacked on PUSCH

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| Company | Comments |
| LG Electronics | First of all, we think that M2-1 and M 2-2 were already discussed during the past preparation phase/technical discussion but failed to be selected as critical remaining issues or reach agreements. In this sense, our preference is to remove M2-1 and M 2-2 and rather include PP-2 or PS-2 which has never been discussed before but needs clarification.  Secondly, in our understanding, there was no consensus in Rel-16 feature discussion to have further optimization for SL communication between UEs having different timing synchronization sources. So, SY-1 should be removed. |
| OPPO | For M2-1: The infinite loop issue should be discussed because it is a logical error of current mode 2 procedure.  For M2-2: The collision between multiple TBs has been discussed by both RAN1 and RAN 2 already in the past, and neither group is able to reach any consensus. In R16, we see this as an optimization as the collision/conflict can be resolved by UE implementation. However, we are open to discuss this in R17 as this can have performance impact (e.g. for the selection of Y candidate slots in partial sensing so that UE does not perform sensing in slots that are not necessary and limiting its selection of resources).  For M1-3-2: It is an essential issue in our view and it should be addressed. It is already agreed that SL transmission does not use SL HARQ feedback is supported in RAN2, but how a UE report ACK/NACK to gNB on PUCCH is not captured in the spec. In RAN1, we already made the following agreement in RAN1#100bis-e and it should be reflected in the spec. Otherwise, the UE behavior of how to report ACK/NACK to gNB is not defined when SL transmission does not use SL HARQ feedback.  Agreements:   * The working assumption (as in proposal 4 in the summary) from RAN1#100-e is confirmed.   + If the SL transmission does not use SL HARQ feedback (if supported by RAN2), the UE reports NACK to request further resources for blind retransmission and ACK otherwise. |
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**Topics in each FL summary**

**Physical layer structure**

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

* [R1-2103708, Ericsson]: reference of number of layers (ʋ) determined according to the 'Number of DMRS port' field

Issue PS-1: Logical or physical slots in RS sequence generation and mapping

* For RS sequence generation, whether the slot number is logical slot index or physical slot index considering in-coverage scenario with different serving cells.
* [R1-2103213, Samsung], [R1-2103375, LG]

Issue PS-2: SL BWP and UL BWP relationship

* How to generate OFDM baseband signal for NR sidelink considering the center frequency/RB boundary of UL BWP.
* [R1-2103375, LG]

Issue PS-3: Clarifying multiple PSFCH transmission

* It may need to fix the description in simultaneous PSFCH transmission/reception.
* [R1-2103466, Sharp]

Issue PS-4: PSSCH reserved bit definition

* Whether to clarify a UE assumption on the number of reserved bits for PSSCH
* [R1-2103709, Ericsson]

**Synchronization**

Issue SY-1: Timing misalignment between eNB/gNB, gNB/gNB [R1-2102591, CATT, GOHIGH] [R1-2102795, OPPO]

Issue SY-2: NR SL-TDD-Config in the coverage of eNB [R1-2102942, vivo]

Issue SY-3: Indication of the non-TDD case in sl-TDD-Config [R1-2103468, Sharp]

Issue SY-4: Clarification of the notation of “u\_slots^SL” [R1-2103468, Sharp]

**Mode 1**

Issue M1-1: DCI-related aspects

Issue M1-1-1: dci-FormatsExt vs dci-FormatsSL (see Nokia+NSB (P2, P3), vivo (P2, P3), LGE (P1)

Issue M1-1-2: Value of n\_CI (see vivo (TP1))

Issue M1-1-3: For size alignment, include DCI formats for other purposes (see vivo (TP2))

Issue M1-2: Codebook construction

Issue M1-2-1: For Type 1, the number of PSSCH slots associated with the same PSFCH slot could be smaller than the PSFCH resource period

Issue M1-2-2: How to operate with multiple resource pools with different PSFCH periods

Issue M1-2-3: TX power

Issue M1-3: SL HARQ-ACK reports to gNB

Issue M1-3-1: Change RRC parameter values

Issue M1-3-2: SL HARQ-ACK reporting in UL when the SL transmission (scheduled by DG/CG) does not use SL HARQ feedback

Issue M1-3-3: Report ACK when DG is not used

Issue M1-3-4: Slot offset between PSFCH and HARQ-ACK reporting (i.e., k>0 always)

Issue M1-3-5: Some companies discuss actions for a potential reply by RAN2 to LS R1-2102176. In all cases, they suggest waiting for a reply LS

Issue M1-4: Editorial

• TS 38.211

O 8.4.1.2.2: See OPPO

• TS 38.212

O 7.3.1.4.1: DCI format 3\_0 clarification that the configuration index is reserved for DG scheduling a retransmission for CG (see ASUSTeK (TP5), Sharp (TP2))

• TS 38.213

O 10.1:

 Remove ‘a SL-RNTI, a SL-CS-RNTI, or a SL-L-CS-RNTI’ (see Sharp (TP4-1 and TP4-2))

 Other editorial (see Sharp (TP1-1))

O 16.5:

 Clarify that the UE does not expect to multiplex SL HARQ and Uu UCI on PUCCH or PUSCH (see vivo (P9))

 “One bit” (see Sharp (TP6))

 Other editorial (see Sharp (TP1-1))

• TS 38.214

O 8.1.2:

 Clause number (see ASUSTeK (TP3), Sharp (TP1-2))

O 8.1.2.1:

 2xTypo (see vivo (P5))

 RRC parameter name (see ASUSTeK (TP3))

O 8.1.4: ASUSTeK (TP3)

O 8.2.1: See OPPO

**Mode 2**

Issue M2-1 – Infinite loop due to excessive resource exclusion in step 5)

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

Issue M2-3 – Backward indication

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, send LS

Issue M2-6 – ‘sl-ThresPSSCH-RSRP-List’ to ‘sl-Thres-RSRP-List’ replacement

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

Issue M2-9 – Correction to step 6) to include slots within Tproc0

Issue M2-10 – Replacing ‘sl-ResourceReservePeriod1’ by ‘sl-ResourceReservePeriodList’ in 213, clause 16.4

**Physical layer procedure**

Issue PP-1: How SL HARQ-ACK report is piggybacked on PUSCH [vivo,3] [Apple,4] [LG,5] [Huawei,6] [DCM,8]

* Aspects on which PUSCH transmission is used to convey SL HARQ-ACK reporting
* Aspects on scheduling restriction avoiding certain overlapping case(s)

Issue PP-2: Further clarification on reference RS used for pathloss derivation [vivo,3] [ASUSTeK,9]

* Aspects on which serving cell is the reference cell for pathloss derivation
* Aspects on beam failure case

Issue PP-3: Additional prioritization rule

* Issue #3-1: Tie-break for prioritization between PSFCH TX and PSFCH RX [CATT,1]
* Issue #3-2: Prioritization rule between PUSCH carrying SL HARQ-ACK reports and SL transmission [Fujitsu,2] [vivo,3]

Issue PP-4: UE procedure for overlapping UL TX and SL RX [ZTE,7]

Issue PP-5: Minimum number of retransmissions for groupcast with SL HARQ-ACK feedback Option 1 [Intel,10]

**QoS**

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