3GPP TSG RAN WG1 Meeting #101-e R1-200xxxx

e-Meeting, May 25th – June 5th, 2020

Agenda Item: 7.2.4.2.1

Source: Moderator (Ericsson)

Title: Feature lead summary#1 on Resource allocation for NR sidelink Mode 1 v0

Document for: Discussion, Decision

# 1 List of critical issues

## 1.1 Remaining issues for dynamic and configured grant

## Topics highlighted in yellow are the proposal from the FL for discussion in thread #2.

1. Dynamic grant: number of PUCCH resources per grant.
2. Configured grant
   1. Whether to use physical or logical slots.
   2. Type-1: remaining details of frame indexing
   3. Remaining details on HARQ process ID determination
3. Processing times
   1. Whether to support multiple UE capabilities or not and, if so, how many.
   2. With lower priority, values for
      1. PSCCH/PSSCH preparation time.
      2. PSFCH to UL report time: working assumption (on N) and FFS (on X) from RAN1#100bis-e.
4. Any issue related to this AI and the LS from RAN2 in R1-2003256.

## 1.2 DCI aspects

## Topics highlighted in yellow are the proposal from the FL for discussion in thread #2.

1. Contents of DCI format 3\_0:
   * Size of the following agreed fields: Time gap, HARQ process ID, Configuration index, counter SAI (for Type-1 codebook), PSFCH-to-HARQ\_feedback timing indicator
   * Indication of activation/release for Type-2 CG
   * Define the combination of PSFCH-to-HARQ feedback timing indicator and PUCCH resource indicator used to indicate that PUCCH resource is not provided.
   * Whether to include a Resource pool index and, if so, details.
2. Alignment of DCI format 3\_0 with other DCI formats

## 1.3 HARQ reporting to gNB

## Topics highlighted in yellow are the proposal from the FL for discussion in thread #3.

1. Type-1 codebook for reporting in UL-SCH
   * Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.2.2
2. Type-2 codebook for reporting in UL-SCH
   * Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.3.2
3. ~~Collisions between SL HARQ-ACK reports and other Uu UCI.~~
4. Details in the WA from RAN#100-e for the case of reaching the maximum number of HARQ re-transmissions for a TB.

## ~~1.4 Processing times~~

1. ~~PSCCH/PSSCH preparation time.~~
2. ~~PSFCH to UL report time: working assumption (on N) and FFS (on X) from RAN1#100bis-e.~~

## 1.5 Miscellaneous

1. Corrections and clarifications to the specification (multiple contributions)

# Company views

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| --- | --- |
| **Company** | **View** |
| NTT DOCOMO | 1.1: We support FL proposal. In addition, we believe that MCS range restriction should be discussed in this thread. The issue is how to use only one set of sl-MaxMCS-PSSCH-r16 and sl-MinMCS-PSSCH-r16, for multiple MCS tables, This has potential RRC impact.  1.2: We support FL proposal. In addition, ‘Size of the following agreed fields’ should include PSFCH-to-HARQ feedback timing indicator field as well, which is FFS in the agreements at the last e-meeting.  1.3: In our understanding, this thread includes potential RRC impact of betaOffsets and scaling for SL HARQ-ACK multiplexing on PUSCH, and UL DAI issue. If this is correct understanding, we support FL proposal. Regarding third one, which AI is this discussed, in procedure AI or here?  FL reply:  Regarding 1.1, I suggest discussing any issue in that LS that is related to this AI.  Regarding 1.2, I have added the field.  Regarding 1.3, all issues related to reports on PUSCH must be discussed, including beta offset, etc.  For the prioritization, it will be in a single AI. I will try to clarify with Hanbyul. |
| vivo | Agree with FL’s proposal for issue 1.1 and 1.2.    **Regarding 1.3:**  tDAI field exists in UL DCI for single-cell case as long as type2 codebook is configured.  We have agreed to reuse the R15 procedure for SL HARQ reporting in Uu. Although the type-1/2 codebook as well as the SAI were discussed in last meeting, the issue of UL DAT (i.e., tSAI field in UL DCI) has not been discussed and the behaviour is not clear.  We need to clarify how to indicate SAI in UL DCI before discussing the details of SL CB on PUSCH.  So we propose to modify 1.3 as below   1. DCI format 0-1 should indicate SAI when SL HARQ codebook is multiplexed on the scheduled PUSCH    * Details on the SAI indication, e.g., whether to introduce separated SAI field for UL DCI or reuse the R15 DAI in UL DCI to indicate SAI. 2. Type-1 codebook for reporting in UL-SCH    * Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.2.2 3. Type-2 codebook for reporting in UL-SCH    * Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.3.2 4. Collisions between SL HARQ-ACK reports and other Uu UCI.   FL reply:  Regarding 1.3, we need to discuss all details about the reporting on PUSCH. Let us keep the wording as it is.  [Round-3]  For the newly added 1.1.3 “Processing times”, I think it should be discussed in UE feature AI if needed. So I suggest removing this from 1.1.  Regarding 1.3, if FL’s understanding is that the UL DAI/SAI issue is related to HARQ reporting on PUSCH, we are fine to discuss the details of PUSCH reporting, given that issue of “Collisions between SL HARQ-ACK reports and other Uu UCI” is removed from thread #3. It is desirable to start the technical discussion earlier for better understanding the issue among companies. |
| OPPO | * 1. we agree that the highlight part should be discussed. For the one left topic of “remaining details on HPN determination”, we think it is related to both RAN1 and RAN2. We agree in principle to reuse the same mechanism of UL CG, while there is some difference between SL CG and UL CG needs to be clarified. For example, there is up to 3 SL CG resources within a period, while only 1 for UL CG. And whether it is allowed that the slot index of SL CG resource of each SFN period can be different (the same issue have been identified and discussed in IIoT) ? These issues is more suitable to be discussed in RAN1. And considering only 1 meeting left for RAN2, if we don’t discuss them, it is hardly for RAN2 to make progress.   Furthermore, we have made the following agreement in RAN1 #99. While according to the email discussion during RAN1#100b-e, companies have different view on the highlight part. In my view, there are at least 3 different understanding about “the resources provided by the configured grant”:   * + - 1. The resources are within one SL CG period, i.e. up to 3 resources;       2. The resources can across multiple SL CG periods and these SL CG period can correspond to different HPN;       3. The resources can across multiple SL CG periods, while only limit to the SL CG period correspond to same HPN.   We think at least common understanding should be achieved in RAN1. It is also related to how to determine HPN of SL CG resource. RAN1 should clarify it and inform RAN2 about the common understanding so that RAN2 can make progress.  Agreements:   * For dynamic grant, the number of retransmissions of a TB is up to the gNB. * For configured grant, the maximum number of times that a TB can be retransmitted using the resources provided by the configured grant is configured per priority per configured grant.   1. Agree.   2. For the 4th topic (for the case of reaching the maximum number of HARQ re-transmissions for a TB.), we have some FFS in the WA to be solved, for example, how the UE knows whether/when the maximum transmission number is reached or not. Without that, the spec is in-complete. And it may have RAN2 impact. We think it should be discussed in this meeting to address the issue.   FL reply:  Regarding 1.1, let’s try to discuss 2c once again, given that there seems to be quite some interest. I also suggest discussing any issue in that LS that is related to this AI.  Regarding 1.3, the aspects to the WA (behaviour and message contents) should have no ASN.1 impact (in fact, everything in in 38.213 to this date) I suggest to have the discussion later.  [OPPO]: when we considering how the UE knows the maximum of retransmission in DG, it may have RAN2 impact. For example, in the agreement copied above, the maximum number of re-transmissions per TB for SL CG is configured per priority, if we apply the similar mechanism to DG, that will have RAN2 and ASN.1 impact.  We are open to the solutions, while some of them may have RAN2 impact, and we cannot preclude any candidate solution at current stage.  FL2 reply:  For dynamic grant, no parameter is necessary as the maximum number of transmissions is up to the gNB:  Agreements:   * For dynamic grant, the number of retransmissions of a TB is up to the gNB. * For configured grant, the maximum number of times that a TB can be retransmitted using the resources provided by the configured grant is configured per priority per configured grant.   Given that we are in late maintenance phase, I think we should aim for solutions with the smallest possible impact. |
| CMCC | 1.1 we agree that the highlight part should be discussed. For the one left topic of “remaining details on HPN determination”, we share similar view with OPPO and think it is very likely to have impact on RAN2. Moreover, RAN2 sends LS to RAN1 in R1-2003256 to check views on HARQ ID determination for SL CG, RAN1 should clarify it and reply the LS so that RAN2 can make progress.  1.2 Agree  1.3 Agree. We have same question with DCM and wonder which AI will the prioritization/multiplex issue be discussed.  FL reply:  For 1.1.: The point about the LS makes sense  For 1.3: See my reply to DCM |
| CATT | Agree with FL’s proposal on the 3 threads. |
| Huawei, HiSilicon | 1. We are generally supportive with this FL proposal. Additionally, whether/how to support CG repetition within a period should be involved in this email thread as well. We had a short discussion but without explicit outcome in the last meeting, and it may have RAN2 spec impact. 2. Support this proposal. 3. Besides the listed issue, the X value for SL HARQ preparation time which is a left FFS from last meeting should be discussed. It is indispensably related to the time restriction for reporting SL HARQ to gNB and PUCCH indicating by gNB, so we think it should be decided in this meeting.   FL reply:  For 1.1: there was no consensus on repetition last time. Given that this is not widely treated and that it received very little interest last time, my proposal is to skip this discussion.  Regarding 1.3, the value of X can be discussed as part of the processing/preparation times. I think this is less urgent given that it has no ASN.1 impact.  [HW, HiSi]:  The reason why we think PSFCH to UL reporting time as well as PSCCH/PSSCH preparation time are essential and should be discussed firstly is that without timing definition, the specification cannot be fully interpreted and gNB cannot schedule the UEs properly. As the issue 1.1#3, we share the views of the other companies, it is too abstract to discuss how many (or what values of) capabilities to have for an issue where we do not know the physical layer details yet.  For 1.1, some companies commented it had already supported Nmax time repetition within a period for CG resources in last meeting, but actually it is still unclear in RAN1 what resources are provided by the configured grant. Just as the comments from OPPO, 3 possible interpretations for this term, and CG repetition within a period would be quite attractive due to less latency and higher reliability in some certain cases. So we think it can be discussed in the Issue 1.1#2.  For 1.3 #1 and #2, we agree to complete codebook design in this meeting, but recall the related discussion in last meeting, more essential works are done by the spec changes discussion in the TP phase. So, if companies predict not too many technical agreements need to be reached, we think we can finish these codebook designs directly by a TP discussion in the later phase, then we can have a substituted email thread of Issue 1.4.  FL2 reply:  See my reply to Futurewei  For 1.1, I based my list of proposed topics on the contributions from companies. I am afraid there was very little discussion or support. In any case, as in previous meetings there will be an ’others’ table for related proposals.  For 1.3, last meeting we made agreements, conclusions, and TPs. There was very good progress but it took quite a few iterations. For this meeting, I have put together both discussions as part of a thread. I do not think that it is a good idea to reduce the possibility of discussion even further. |
| Fraunhofer | * 1. and 1.2: We agree with the FL’s proposal   1.3: We feel that the 4th topic regarding the UE’s action when reaching the maximum number of HARQ retransmissions has to be addressed. The WA that was confirmed in the previous meeting stated that the content of the report send by the UE and the UE behaviour are FFS, and we feel that they have to be resolved in this meeting.  FL reply:  For 1.3, there is no question that the issue must be addressed. But given that it has very limited impact to RAN1 specs, I suggest not treating it this time. |
| Intel | We are in general fine with the list. In the same time, we have worries that if PSCCH/PSSCH preparation time is not discussed this meeting, there is no chance to introduce different capabilities later, since these changes would be backward incompatible to ASN.1 for UE capability.  In other words, we do see RAN2 and ASN.1 impact in PSCCH/PSSCH preparation time issue, and suggest to find a place to discuss it somewhere within these 3 threads.  FL reply:  My concern is that having a discussion on processing/preparation times may be too much for the thread. But I suggest discussing whether we want to have different capabilities or not. |
| Apple | Thread 1: Issue 1.1. In case capacity allows, the issue “Remaining details on HARQ process ID determination” may also be discussed.  Thread 2: Issue 1.2. One remaining issue of the presence/size of “PSFCH-to-HARQ feedback timing indicator” field in DCI format 3\_0 may also be discussed.  Thread 3: Issue 1.3 with first 3 bullets. The number of PUSCH resources allocated for SL HARQ report (similar to TS 38.213 Section 3) may also be discussed. The applicability of transmission SL HARQ report on PUSCH may also be discussed (e.g., whether to support SL HARQ report piggyback on PUSCH with URLLC data).  FL reply:  For 1.1, see my reply to OPPO.  For 1.2, see my reply to DCM.  For 1.3, I suggest not increasing the scope. We have agreed to reuse Rel-15 procedures. Let us focus on that at this point. |
| ZTE, Sanechips | We are ok with most parts of FL’s proposal, and would like to have following additional suggestions:  1) Issue 1.4 can be combined into 1.1.  2) The 3rd issue “Collisions between SL HARQ-ACK reports and other Uu UCI” in 1.3 should be handled in PHY-procedure agenda. So far all prioritization issues are handled in PHY-procedure. To discuss them in the same agenda would help to reach better integrity of whole framework.  We further wonder whether RAN1 should try to cover all listed issues except ones in 1.5. Any tried but unsolvable issues can be left for company CR discussion after June plenary.  FL reply:  On 1) see my reply to Intel  On 2) see my reply to DCM |
| Nokia, NSB | The proposed list looks good.  For 1.3, we propose to include issue 4 “case of reaching the maximum number of HARQ re-transmissions for a TB”  FL reply:  For 1.3, see my reply to Fraunhofer |
| Futurewei | We are generally supportive of the three directions. Regarding the newly added 1.1.3 (processing times): in our view, it is difficult to discuss whether we will have a UE capability before we have an idea of what the actual processing time will be. We would be okay with either one of the two options: a) replacing 1.1.3 by a discussion on processing time (although we agree with FL that this would be a very broad scope for a discussion) or b removing it altogether  Also, what is the status of 1.3.3: to be discussed here or in procedures?  FL2 reply:  My intention is not to avoid the discussion on times altogether but we can at least understand whether we want different capabilities or not. I anyways add a discussion on the values but clarifying that priority is lower.  1.3.3 will be discussed under procedures. I have captured it above now. |
| Qualcomm | 1.1, we don’t see the need to discuss multiple PUCCH resources in a grant. This is an enhancement not present in Uu and is not necessary at this stage. We think that 1.1.3a isn’t critical to discuss. We agree with the remaining items.  1.2, we don’t think there a need to discuss adding resource pool index.  1.3, we agree with the proposed topics.  FL2 reply:  For 1.1, the fact is that we do not have agreements in either direction. We need to clarify this.  For 1.2, the proposal is present in many contributions. I think that proponents should explain why this is necessary. Based on that, we can make a decision either way. |
| LG Electronics | **1.1**:  In “Processing Times”, we are wondering whether it is technically possible/desirable to discuss **the issue relevant to X value** (i.e., Tprep changes depending the number of PSFCHs to be received) since at this moment there is no agreement on the maximum supported number of PSFCH receptions in the UE feature discussion (including the number of relevant UE capabilities). So, our preference is to remove it. For **PSCCH/PSSCH preparation time**, could you clarify what exact meaning of it and whether it is different from the issues to be discussed/covered in the UE feature discussion?  For “Dynamic grant: number of PUCCH resources per grant”, we share the same view with Qualcomm and prefer to remove it.  **1.2**:  In “Contents of DCI format 3\_0”, we don’t think that **whether to include the resource pool index** is the critical one that should be introduced to complete Rel-16 NR V2X specification. Our preference is to remove it.  FL2 reply:  Regarding 1.1, we have an FFS on the value of X that we need to clear out. The preparation time refers to the time between the reception of DCI and the time of the first SL transmission. We need to define a minimum value, I would say. Regarding the number of resources per grant, see my reply to QC.  Regarding 1.2, see also my reply to QC.  LG reply:  To our understanding, the main motivation of X value was to define different Tprep values depending on how many PSFCHs are needed to be received. However, at this moment, it is not clear what maximum number of PSFCH receptions can be supported by UE, and the relevant discussion/decision will be performed in UE feature discussion in this meeting. Without having the clear UE capability for the maximum supported number of PSFCH receptions, do you think that we can simply decide “X value” or “relation between Tprep and PSFCH number to be received”? If not, why this issue needs to be included? |
| MediaTek | Issue 1.1:  We prefer to remove “Dynamic grant: number of PUCCH resources per grant” (1.1.1). In our understanding, this is not essential to complete R16, but rather an optimization/enhancement. We should also remove 1.1.3a. Justification for multiple SL processing capabilities is not clear to us.  Issue 1.2:  RAN2 has an ongoing discussion on the number of sidelink HARQ processes. We shouldn’t discuss “HARQ process ID” bitfield size before RAN2 reaches an agreement. Could we either remove “HARQ process ID” from the discussion for now, or perhaps add a note saying that the HARQ process ID bitfield size will not be discussed until RAN2 makes a decision on the number of SL-HARQ processes.  Issue 1.3:  We agree with FL proposal.  FL2 reply:  Regarding 1.1, see my reply to QC.  Regarding 1.2, I hope we can quickly agree to have as many bits as necessary to meet the RAN2 agreements. If not, we will leave this part of the discussion without a conclusion. |
| Convida Wireless | We agree with the FL’s proposal on the 3 threads. |