**3GPP TSG RAN WG1 #117 R1-2405353**

**Fukuoka city, Fukuoka, Japan, May 20th – 24th, 2024**

**Source: Moderator (OPPO)**

**Title: FL summary #1 for AI 8.1: SL-U channel access and RA**

**Agenda item: 8.1**

**Document for:** **Discussion and Decision**

Introduction

This contribution provides a summary of submitted contributions, discussion topics and outcomes that are related to the channel access mechanisms for SL-U during this RAN1 meeting. Note that, all past outcomes including agreements, conclusions and working assumptions reached during this WI are captured in Section 7 (Appendix) of this document.

Collection of agreements / outcomes of RAN1#117

To be filled

Topics for discussion

## [ACTIVE] Topic #1: CPE for PSSCH/PSCCH and PSFCH

**Issue 1-1 on CPE starting position determination and transmission for PSSCH/PSCCH [1, 5, 8, 22]**: In RAN1#116bis, the latest status / version of TP for agreement proposal was TP#11 version 1 of the EOM version of FL summary in R1-2403457. Unfortunately, due to lack of time it was not treated. In this meeting, [1, 5, 22] discussed the same issue and submitted an almost same version or a very similar version (with some cut downs). Therefore, the moderator proposes to start with the version submitted in [22] because it also includes a correction on the CPE index for 𝐶𝑖 (not an editorial correction), and also adding two wording changes from [8] (by default, only). Note that, RRC parameter name alignments are to be treated together in Topic #7.

**Issue 1-2 on CPE starting position determination and transmission for PSFCH [23]**: In RAN1#116bis, during the discussion for the above issue 1-1 and also the CPE starting position for S-SSB issue 1-2, the wording text on “the CPE starting position within the first one or two symbols before the start of the XXX transmission” was discussed. So, beside the wording are used for S-SSB or to be used for PSCCH/PSSCH transmissions, the same wording is also already used for PSFCH. However, it was realized that the same wording text “one or two symbols” may not be 100% accurate, since the gap symbol before the PSFCH is always 1. Also in TS 38.331, the description for the parameter *sl-CPE-StartingPositionPSFCH* is captured as:

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| ***sl-CPE-StartingPositionPSFCH***  Indicates CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. |

Therefore, it is proposed in [23] to correct this error in TS 38.213, as followed.

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| The PSFCH resources are first indexed according to an ascending order of the interlace or PRB subset index, second according to an ascending order of the RB-set index, and then according to an ascending order of the cyclic shift pair index from the cyclic shift pairs. The UE applies CP extension to the first symbol of a PSFCH and within the first one symbol before the first symbol of the PSFCH according to an index [4, TS 38.211] provided by *sl-CPE-StartingPositionPSFCH*. |

### Round 1 discussion

**Proposal 1-1 (I): For Issue 1-1, is the proposed TP#8 in Section 4.8.1 of this FL summary agreeable to resolve the issue of CPE starting position determination for PSSCH/PSCCH transmission?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | Support |
| QC | Comments | The most necessary part is “any one of the RB sets” and CPE index for Ci.  On the rest we do not think is strictly necessary, but we are open to clarification.  e.g. “indended” can be removed everywhere (prefer over adding it everywhere because now it raises the question of: do we need it anywhere else in the spec?).  Negative on “by default/only” which seems redundant, and overly stressing a difference in policy between out-COT and in-COT that does not exist. |
| NEC | Yes |  |
| CATT/CICTCI | Comments | Generally fine with the CR, except for the change of “intended”. Our understanding is that the transmission(s) described in section 8 is always the intended transmission. Emphases it everywhere is not necessary, otherwise, the remaining CR work may be huge.  Regarding the “by default/only”, it clearly comes from our previous agreement which is missed in the sepc.   |  | | --- | | Working assumption **#114**  When UE performs Type 2 channel access to transmit PSCCH/PSSCH within a COT:   * By default, only one value is (pre-)configured for the set of CPE starting position for inside COT   + The value is the default CPE starting position   + UE only use the (pre-)configured default CPE starting position * When more than one values are (pre-)configured for the set of CPE starting position for inside COT   + One of these values is the default CPE starting position   + UE use the same method for using CPE for the case when UE performs Type 1 channel access to initiate a COT for PSCCH/PSSCH transmission * FFS: whether to support that CPE can be transmitted between any two consecutive SL transmissions between COT initiator and responder, to reduce the gap between two transmissions so that it does not exceed 16us, the CPE is selected from the CPE(s) (pre-)configured for PSCCH/PSSCH within a COT | |
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**Question 1-2 (I): For Issue 1-2, is the proposed TP#9 in Section 4.9.1 of this FL summary agreeable to resolve the issue of CPE starting position determination for PSFCH transmission?**

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| **Company** | **Yes / No** | **Comments** |
| OPPO | Yes | Support |
| QC | Yes |  |
| NEC | Yes |  |
| CATT/CICTCI | Yes |  |
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## [ACTIVE] Topic #2: UE-to-UE COT sharing

**Issue 2-1 on COT sharing parameters only present when COT sharing flag is on [3]**: Since the 'COT sharing flag' is not explicitly defined in TS 37.213, it will be confusing to say “1 bit as defined in [14, TS 37.213]”. The fields of CAPC, etc., are presented only if the 'COT sharing flag' field in SCI format 1-A is present and set to '1'. The current spec seems to imply that these fields are still present when 'COT sharing flag' field in SCI format 1-A is set to '0'.

* FL comment: For the first change below is a new proposal. For the second change, it was discussed in RAN1#116bis and the general feeling is that it is redundant since the earlier part of the sentence says “… is present and set to ‘1’…”.

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| < Start of text proposal for TS 38.212 > 8.3.1.1 SCI format 1-A SCI format 1-A is used for the scheduling of PSSCH and 2nd-stage-SCI on PSSCH  The following information is transmitted by means of the SCI format 1-A:  < Unchanged parts are omitted >  - COT sharing flag – 0 or 1 bit  - 1 bit if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured;  - 0 bit otherwise.  < Unchanged parts are omitted > 8.4.1.1 SCI format 2-A SCI format 2-A is used for the decoding of PSSCH, with HARQ operation when HARQ-ACK information includes ACK or NACK, when HARQ-ACK information includes only NACK, or when there is no feedback of HARQ-ACK information.  The following information is transmitted by means of the SCI format 2-A:  < Unchanged parts are omitted >  If the 'COT sharing flag' field in SCI format 1-A is present and set to '1', all the remaining fields are present and set as follows:  - CAPC – 2 bits. Values '00', '01', '10' and '11' correspond to CAPC values '1', '2', '3' and '4' as defined in Table 4.5-1 of [14, TS 37.213], respectively.  - COT sharing cast type – 2 bits as defined in Table 8.4.1.1-1.  - COT sharing additional ID – 24 bits. The 16 LSBs provide layer 1 destination ID and the 8 MSBs provide layer 1 source ID, as defined in [6, TS 38.214]. The 8 MSBs are reserved when the COT sharing cast type field is set to '00' or '01'.  - Remaining COT duration – bits as defined in clause 4.5.3 of [14, TS 37.213], where is defined in Table 4.2-1 of Clause 4.2 of [4, TS 38.211].  < End of text proposal for TS 38.212 > |

**Issue 2-2** **on applicable RB set(s) for COT sharing [20]**: It's ambiguous in current TS to determine the applicable RB set(s) for COT sharing for following two reasons.

* when *sl-MaxNumPerReserv* is configured with > 1 value, the “Frequency resource assignment” field in the 1st stage SCI with COT sharing may indicates multiple reserved resources. In this case, only the RB set(s) associated with the first reserved resource is an appliable sharing RB set(s) and the RB set(s) associated with remaining reserved resources is not appliable because CO is not obtained yet.
* "a UE initiates a channel occupancy to transmit SL transmission(s) within a RB set(s)" has ambiguous. For instance, when UE initiates CO and transmits SL transmission in RB set 0, the appliable RB sets may be incorrectly understood as RB set 0 plus RB set 1 because SL transmission within RB set 0 can also be regarded as transmission within RB set 0 plus RB set 1.

Based on above reasons, it's necessary to clarify that the appliable RB set(s) for sharing is the RB set(s) associated with the first resource indicated by the “Frequency resource assignment” field in the SL control information.

* FL comment: In RAN#116bis, the general understanding is that a correction is need to resolve this issue. The latest status / version of the TP is the TP Alt. 1 below for TS 37.213. The TP Alt. 2 is a new alternative proposed in this meeting by [20].

TP Alt.1 in TS 37.213

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| < Start of text proposal for TS 37.213 >  4.5.3 SL channel access procedures in a shared channel occupancy  When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy, i.e., the RB set(s) associated with the first resource indicated by the “Frequency resource assignment” field in the SL control information. The channel occupancy sharing information can also include additional IDs and associated cast type. The additional IDs includes one pair of Layer 1 source and destination IDs for all cast types, where the source ID is set to the source ID of the UE initiating channel occupancy for unicast and to the reserved bits for groupcast and broadcast. The channel occupancy sharing information transmitted in slot indicates the remaining channel occupancy duration in a number of physical slot(s) . If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot .  < End of text proposal for TS 37.213 > |

TP Alt.2 in TS 38.214

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| < Start of text proposal for TS 38.214 >  8.1.2.2 Resource allocation in frequency domain  < Unchanged parts are omitted >  For operation with shared spectrum channel access for frequency range 1, if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB:,  - the lowest index of the RB set allocation to the initial PSSCH transmission is indicated via the field "Lowest index of the RB set allocation to the initial transmission" of the DCI format 3\_0.  - the starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 is indicated via the higher layer parameter *sl-StartRBsetCG-Type1*.  For operation with shared spectrum channel access for frequency range 1, appliable RB set(s) for COT sharing is the RB set(s) associated with the first resource indicated by the “Frequency resource assignment” field in the SCI containing the channel occupancy sharing information.< End of text proposal for TS 38.214 > |

**Issue 2-3 on remaining COT duration K [42]**:

The current description of the shared channel occupancy based on the intention of sharing from a first UE () allows to share in a region described by the boundaries . The description recites “If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot ”. But if the behavior is unclear, e.g., if and then the shared region is [n+3, n+1], which is a non-causal interval.

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| < Start of text proposal for TS 37.213 >  4.5.3 SL channel access procedures in a shared channel occupancy  When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy. The channel occupancy sharing information can also include additional IDs and associated cast type. The additional IDs includes one pair of Layer 1 source and destination IDs for all cast types, where the source ID is set to the source ID of the UE initiating channel occupancy for unicast and to the reserved bits for groupcast and broadcast. The channel occupancy sharing information transmitted in slot indicates the remaining channel occupancy duration in a number of physical slot(s) . If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). When , is not expected to be indicated. Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot .  < End of text proposal for TS 37.213 > |

### Round 1 discussion

**Question 2-1 (I): Do you agree with the COT sharing flag corrections for TS 38.212 as proposed in the above Issue 2-1?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No | In TS 37.213, the following description is captured for COT sharing information.  *When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy. The channel occupancy sharing information can also include additional IDs and associated cast type.*  For the 1st change () in TS 38.212, we slightly prefer to keep this, as it indicates to the reader the above COT sharing information defined in TS 37.213. Without the reference, it is harder for the reader to find out the purpose for this parameter field.  For the 2nd change, it does seem redundant to add another “present” in the sentence. |
| QC | No | Same thinking as OPPO. |
| NEC | No | We’re neutral about these two changes as they are kind of clarifications. |
| CATT/CICTCI | Yes | The first change seems reasonable, since we reached the following conclusion in the last meeting, and the consequence is we won’t have the definition of COT sharing flag in TS 37.213. With this reference, the reader may be more confused. Or, we can change the reference into clause 8.3.1.1.   |  | | --- | | **Conclusion**  It is concluded that no spec change is needed for the issue of COT sharing flag in R1-2402219. |   According to the following agreement, we are ok with the second change.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Agreement  In SCI format 1-A, if higher layer parameter *transmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured:  **Table X: 2nd-stage SCI formats for SL operation in shared spectrum**   |  |  |  | | --- | --- | --- | | **Value of 2nd-stage SCI format field** | **1 reserved bit (1st stage SCI)** | **2nd-stage SCI format** | | 00 | 0 | SCI format 2-A (existing) | | 1 | SCI format 2-A (COT-SI fields are provided) | | 01 (Reserved) | 0 | Reserved | | 1 | Reserved | | 10 | 0 | SCI format 2-C (existing) | | 1 | Reserved | | 11 (Reserved) | 0 | Reserved | | 1 | Reserved |   Note: it is up to the TS 38.212 spec editor on how to capture the above intention. | |
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**Question 2-2 (I): Do you agree that a correction TP for the above Issue 2-2 is needed on the applicable RB set(s) for COT sharing based on the first reserved resource in SCI? If yes, which proposal alternatives should be adopted?**

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| **Company** | **Yes / No** | **Comments (Alt. 1 or Alt. 2)** |
| OPPO | Yes | Alt. 1  We think Alt. 1 seems to be more appropriate place to make the change. And this wording text for TS 37.213 was extensively discussed in the last RAN#116bis meeting. |
| QC | Yes | Alt 2 seems the only appropriate place where to make the change. Our preference is actually to remove RB sets everywhere from TS 37.213, and use only the word “channels”. Any description of RB sets should be elsewhere.  Please note the typo “appliable”. |
| NEC | Yes | We’re the proponent of this TP. We’re fine with either option actually.  Alt.1 is more preferred as this has been reviewed and discussed with a stable opinion. |
| CATT/CICTCI | Comments | We agree with the identified issue, but the suggest wording may not be entirely correct. With only the FRIV, the first resource cannot be determined, since FRIV only provides the starting RB set index for the second (and the third) resource, and the number of RB sets for each of the indicated resources. That is, FRIV itself cannot indicate the RB set(s) associated with the first resource.  According to Clause 8.1.5 of TS 38.214, identify the resource used for PSSCH transmission requiring two parts of information.   |  | | --- | | 8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 1-A The set of slots and resource blocks for PSSCH transmission is determined by the resource used for the PSCCH transmission containing the associated SCI format 1-A, and fields '*Frequency resource assignment*', '*Time resource assignment*' of the associated SCI format 1-A as described below. |   Therefore, the following modification is suggested to resolve this issue.   |  | | --- | | When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy, i.e., the RB set(s) determined by the resource used for the PSCCH transmission containing the associated SCI format 1-A, and the “Frequency resource assignment” field in the SL control information. | |
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**Question 2-3 (I): Do you agree with the correction TP for TS 37.213 as proposed in the above Issue 2-3 on clarifying the remaining COT duration and CPE transmission?**

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| **Company** | **Yes / No** | **Comments** |
| OPPO | Yes | The wording text was extensively discussed in the last RAN1#116bis meeting and it seemed stable. |
| QC | Yes | Necessary and hopefully sufficiently stabilized in last meeting. |
| NEC | Yes |  |
| CATT/CICTCI | No | We don’t think this change is necessary.  K is only to determine the remaining COT duration, anyway, Tproc,0 still exists. This kind of new behaviour proposed in the CR is not expected during the maintenance phase. If there is concern about the case Tproc,0>K, we prefer to revert the modification we made in RAN1#116 meeting, i.e., starting from the end of slot and ending at slot . |
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## [ACTIVE] Topic #3: Contention window adjustment

**Issue 3 on contention window adjustment procedure due to overlap case of no explicit HARQ-ACK feedback in method 1 and method 2 [21]**: In TS 37.213, there are two methods for CW adjustment. In one method (denoted by method 1), UE adjusts the contention window size based on the HARQ feedback(s) corresponding to the PSSCH within a SL reference duration. And in method 2, UE will use the latest CW of any SL transmission in the past. However, the condition of method 1 and method 2 is not mutually exclusive in current specification. For example, PSSCH transmission with HARQ-ACK disabled can satisfy the condition of both method 1 and method 2. It will lead to an ambiguity about which method should be selected in such case. This is mainly because the condition of method 1 doesn’t restrict the HARQ feedback manner for PSSCH transmission and the condition of method 2 uses the description of SL transmission not associated with explicit HARQ-ACK feedback which also includes PSSCH transmission with HARQ-ACK disabled.

* FL comment: In RAN1#116bis, after discussion, the latest status / version of the TP is as followed.

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| < Start of text proposal for TS 37.213 > 4.5.4 Contention window adjustment procedures for SL transmissions If a UE transmits a SL transmission(s) including at least one PSSCH associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s) using Type 1 channel access procedures associated with the channel access priority class on a channel, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  1) For every priority class set .  2) If a HARQ-ACK feedback corresponding to the PSSCH(s) for unicast SL transmission(s) in the reference duration for the latest channel occupancy initiated by the UE, is available:  - If the HARQ-ACK feedback includes only 'ACK', go to step 1; otherwise go to step 5.  3) If a HARQ-ACK feedback corresponding to the PSSCH(s) for groupcast SL transmission(s) in the *reference duration* for the latest channel occupancy initiated by the UE, is available:  - If HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2 is provided by higher layers:  - The UE calculates the ratio between the number of received 'ACK' in the HARQ-ACK feedback and the number of UE(s) from which the corresponding 'ACK'/'NACK' in the HARQ-ACK feedback is expected. If the calculated ratio is equal to or larger than *HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2*, go to step 1; otherwise go to step 5.  - Otherwise:  - If the HARQ-ACK feedback includes at least an 'ACK',go to step 1; otherwise go to step 5.  4) If a HARQ-ACK feedback corresponding to the PSSCH(s) in the reference duration for the latest channel occupancy initiated by the UE is not available, go to step 6.  5) Increase for every priority class to the next higher allowed value.  6) For every priority class ,maintain as it is; go to step 2.  < End of text proposal for TS 37.213 > |

### Round 1 discussion

**Question 3 (I): Do you agree the proposed TP in the above issue 3-1 should be adopted to resolve the overlap case of no explicit HARQ-ACK feedback in contention window adjustment procedures?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | Support |
| QC | Fine | Method 2 can be fine if majority prefers clarification.  Does not seem particularly necessary (we believe that the specification is currently clear, for PSSCH with FB disabled the determination enters the steps, skip to step 6, and then reads the paragraph(\*) with the ‘X consecutive times’ rule). Nevertheless, there is no issue with CR Method 2, that skips the steps altogether and jumps directly to the paragraph(\*).  (\*):If a UE transmits a SL transmission(s) using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission(s) is not associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s), the UE adjusts before step 1 in the procedures described in clause 4.5.1, using the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class . If the corresponding channel access priority class has not been used for any SL transmissions on the channel, is used. For the channel, if the latest value is consecutively used for X times provided by higher layers parameter *sl-CWS-ForPsschWithoutHarqAck* for generation of as described in clause 4.5.1 for PSSCH transmission(s) without associated explicit HARQ-ACK feedback(s), the is increased for every priority class to the next higher allowed value. |
| NEC | Ok | We’re ok to accept it because this can make TS clear. |
| CATT/CICTCI | No | Actually, we have already discussed this issue in RAN1#115 meeting, and had this following agreement.   |  | | --- | | Agreement  TP#4 in Section 4.4.1 of R1-2312251 for TS 37.213 is endorsed. |   For convenience, part of the TP is copied below:   |  | | --- | | 4.5.4 Contention window adjustment procedures for SL transmissions  If a UE transmits a SL transmission(s) including at least one PSSCH using Type 1 channel access procedures associated with the channel access priority class on a channel, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures: |   It can be observed that the agreement is to delete the part proposed in [21], and the reason for this agreement is to align the content with NR-U and to clarify that no matter whether the current transmission is HARQ-enabled, it should reference step 1) to 6) to perform CW adjustment, since the reference duration used to perform CW adjustment is related to previous SL transmission, rather than the transmission requiring CW adjustment. Therefore, the current specification is clear enough.  Given this situation, we don’t think there is any strong reason to revisit this issue. |
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## [ACTIVE] Topic #4: SL resource allocation

**Issue 4-1 on MCSt candidate multi-slot resource for partial sensing [31]:** The combination of MCSt and partial sensing is supported according to the current specification. The current description “*any set of contiguous sub-channels … correspond to one candidate single-slot resource*” covers only a candidate single-slot resource case, but there is no corresponding description for one candidate multi-slot resource (although it is intended by the specification).

* FL comment: This is a newly identified issue that has not been discussed before.

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| 8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2 The UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets included in the corresponding resource pool within the time interval correspond to one candidate single-slot resource or the UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets in consecutive slots included in the corresponding resource pool within the time interval correspond to one candidate multi-slot resource for UE performing full sensing. The UE shall assume that any set of contiguous sub-channels or any set of contiguous sub-channels in consecutive slots included in the corresponding resource pool in a set of *Y* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing periodic-based partial sensing together with contiguous partial sensing and resource (re)selection triggered by periodic transmission (), or in a set of *Y'* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (), where |

**Issue 4-2 on resource selection trigger vs. Type 1 LBT [39]:** In current mode 2 RA, resource selection is triggered at slot n and one or more resources are selected randomly from a window [n+T1, n+T2] after resource exclusion behavior based on received reservation information. However, a selected resource may not satisfy required LBT-sensing duration. For example, a resource at slot n+T1 can be selected by the random selection from an identified set based on sensing. Meanwhile, LBT duration for the TX, which is determined based on the including data, previous HARQ results, etc., may be larger than T1 as CWmax,p = 1023 and thereby the corresponding max LBT duration is 9.247ms. This means, UE shall start LBT before the resource selection timing. This would be impossible for aperiodic transmissions; otherwise, UE shall perform LBT in any slot in preparation for potential aperiodic transmission. This issue is illustrated in the figure below. In our view, such an issue is almost the same as what we discussed for inter-UE blocking at the previous RAN1 meetings.



To solve this issue, a possible correction is resource selection behavior at MAC layer. For resource selection at slot n for a TX, LBT duration is determined before resource selection and then resource is selected such that the LBT-sensing starting timing for the TX at the selected resource is later than slot n.

* **Proposal: For resource selection at slot n for a TX, LBT duration is determined before resource selection and then resource is selected such that the LBT-sensing starting timing for the TX at the selected resource is later than slot n.**
  + **The corresponding resources are excluded in MAC layer.**
  + **Send an LS to inform RAN2 of this mechanism.**
* FL comment: This issue has been brought up previously during the WI. The feedbacks from companies in the last RAN1#116bis meeting can be found in Section 3.5.1 of R1-2403457 for Issue #5-2. It was proposed to conclude that no spec change is needed for this issue, but due to lack of time we didn’t get to treat this proposal.

**Issue 4-3 on Type1 LBT blocking (option 1) in MCSt [39]:** In Option 1 for inter-UE blocking, N consecutive resource(s) and M consecutive resource(s) are excluded in MAC layer. For single-slot resource, naturally N consecutive resource(s) and M consecutive resource(s) mean resources of N consecutive slot(s) and M consecutive slot(s), respectively. This is described in 38.321 as below.

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| NOTE 3Ai: UE may avoid selection of N consecutive resource(s) before a reserved resource of its own, where the selection of N is up to UE implementation from {0,1,2}. UE may avoid selection of M consecutive resource(s) after a reserved resource of its own, where the selection of M is up to UE implementation (at least including 0).  NOTE 3Aj: If configured, UE may avoid selection of N consecutive resource(s) before a reserved resource of other UE when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource, where the selection of N is up to UE implementation from {0,1,2}. UE may avoid selection of M consecutive resource(s) after a reserved resource of other UE when the transmitting symbols of the reserved resource overlap with LBT of its own selected resource, where the selection of M is up to UE implementation from {0,1,2}. It is up to UE implementation how the physical layer reports detected reserved resources to MAC layer. |

However, definition of N consecutive resource(s) and M consecutive resource(s) is unclear for MCSt case. When MCSt is applied, each resource is defined as multi-slot resource. Then e.g., if N\_slot,MCSt = 2, whether 1) N = 2 means resources in 4 slots or 2) still resources in 2 slots is unclear. Example with N = 2, M = 4, and N\_slot,MCSt = 2 is illustrated below.

* At the first one, N = 2 consecutive resources and M = 4 consecutive resources are resources in N = 2 consecutive slots and M = 4 consecutive slots, regardless of whether the UE applies MCSt or not. For this MCSt case, any resource including the N = 2 consecutive slots or the M = 4 consecutive slots are excluded. That is, N = 2 consecutive resources and M = 4 consecutive resources mean N = 2 adjacent multi-slot resources and M = 4 adjacent multi-slot resources.
* At the second one, N = 2 consecutive resources and M = 4 consecutive resources are resources in 4 consecutive slots and M = 8 consecutive slots, when the UE performs resource selection based on MCSt. In this interpretation, actually excluded adjacent resources are more than N = 2 or M = 4.



In our understanding, intention of exclusion of N consecutive resource(s) and M consecutive resource(s) is to avoid inter UE blocking due to type 1 LBT, which implies that the exclusion target (duration) is not relevant to MCSt. That is, exclusion duration for N consecutive resource(s) and M consecutive resource(s) should not be dependent on whether MCSt is used or not.

* **Proposal: Clarify that N consecutive resource(s) and M consecutive resource(s) in Option 1 for inter-UE blocking are referred to those in case of single-slot resource. For MCSt, multi-slot resources fully or partially overlapped with the N consecutive single-slot resource(s) and M consecutive single-slot resource(s) are not selected.**
  + **Send an LS to inform RAN2 of this clarification.**
* FL comment: This issue has been brought up previously during the WI. The feedbacks from companies in the last RAN1#116bis meeting can be found in Section 3.5.1 of R1-2403457 for Issue #5-3. It was proposed to send an LS to RAN2 clarifying that N consecutive resource(s) and M consecutive resource(s) in Option 1 for Type 1 inter-UE blocking are referring to single-slot resource(s). But due to lack of time we didn’t get to treat this proposal.

**Issue 4-4 on SL resource sensing in slots with two starting symbols [40]:** In the clause 8.1.4 of 38.214, sensing behaviour is described for mode 2 resource allocation. Which slot shall be monitored is determined in step 2 for each of full sensing and partial sensing.

However, detailed UE behaviour in case that two starting symbols are (pre-)configured is not described in the clause and any other specification. In R18 SL, two starting symbols are available at each slot and thus there are two PSCCH occasions in such a slot. In this case, some UE may monitor PSCCH from both the first starting symbol and the second starting symbol, and other UE may monitor PSCCH from only the first starting symbol. Expected UE behaviour should be clarified, and TX UE should not skip monitoring any PSCCH occasion in identified monitoring slots.

It is proposed to clarify that UE performs monitoring PSCCH starting from both the first starting symbol and the second starting symbol in non-PSFCH slot, if two starting symbols are (pre-)configured. Otherwise, UE may skip monitoring PSCCH from the second starting symbol. Reservation information transmitted by other UE from the second starting symbol is missed in this case.

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| 8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  **<Unchanged parts omitted>**  2) The sensing window is defined by the range of slots [), when the UE performs full sensing, where is defined above and is defined in slots in Table 8.1.4-1 where is the SCS configuration of the SL BWP. The UE shall monitor slots which belongs to a sidelink resource pool within the sensing window except for those in which its own transmissions occur. The UE shall perform the behaviour in the following steps based on PSCCH decoded and RSRP measured in these slots.  **<Unchanged parts omitted>**  In the monitoring slots without PSFCH symbols, the UE shall decode PSCCH transmissions starting from the first candidate starting symbol provided by *sl-startingSymbolFirst*, and shall decode PSCCH transmission starting from the second candidate starting symbol provided by *sl-startingSymbolSecond*, if *sl-startingSymbolFirst* and *sl-startingSymbolSecond* are provided.  **<Unchanged parts omitted>** |

### Round 1 discussion

**Question 4-1 (I):** **Do you think the above proposed TP to resolve Issue 4-1 is necessary and agree with it?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | Support |
| QC | Yes |  |
| NEC | Yes |  |
| CATT/CICTCI | Yes |  |
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**Question 4-2 (I):** **Do you think the above Issue 4-2 on Mode 2 resource selection that takes into account of Type 1 LBT sensing time needs to be resolved, and an LS should be sent to RAN2?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No | At the time of resource selection in slot n, the UE cannot predict the actual sensing time required for Type 1 LBT based on logical channel priority or CAPC at the time of selection. Once resource(s) is selected, the logical channel priority and CAPC for the final TB / MAC PDU could still change by the higher layer. Therefore, it is best to rely on UE implementation to avoid insufficient Type 1 LBT sensing time. |
| QC | No | Again, we were sympathetic for doing some enhancements along those lines but we just can’t support it at this stage. |
| CATT/CICTCI | No | This behaviour hasn't been agreed during WI phase and no need to discuss again. |
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**Question 4-3 (I):** **Do you think the above Issue 4-3 on Type 1 LBT blocking (Option 1) in the case of MCSt needs to be resolved, and an LS should be sent to RAN2?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Maybe | We don’t have a strong view on whether to send a clarification note to RAN2 or not. We are OK with either way. In general, we think RAN2 is already aware of this. |
| QC | Fine |  |
| CATT/CICTCI | Unnecessary | We think this is the common understanding, sending LS is unnecessary. |
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**Question 4-4 (I):** **Do you think the above Issue 4-4 on SL resource sensing in slots with two starting symbols needs to be resolved, and whether the proposed TP is acceptable?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No | We think current specification is already clear enough and no change is needed. When a slot is within the sensing window, obviously, UE will monitor all of the candidate PSCCH occasions in this slot. For example, there are many candidate PSCCH positions in the frequency domain (i.e., one PSCCH in one subchannel), but current specification doesn’t explicitly indicate that UE shall monitor each subchannel in a slot with the sensing window. |
| QC | No | If any clarification for this problem is needed (seems not), it won’t be in terms of “shall decode PSCCH in first starting position AND shall decode PSCCH in second starting position” (quite against the proposed wording). |
| CATT/CICTCI | No | Share similar view as QC. |
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## [ACTIVE] Topic #5: Type 1 and Type 2 channel access procedures

**Issue 5-1 on CAPC condition for COT resuming [11]:** The CAPC value restriction, i.e., at most equal to the channel access priority class value initiated the channel occupancy, shall be applied in all the cases, i.e., no exceptional cases have been identified. Therefore, when a COT initiating UE resumes its transmission, the aforementioned restriction shall also be met. The following conclusion has been reached during last RAN1 meeting but the specification has not reflected this until now.

Conclusion

It is concluded that UE can utilize a shared COT only if its SL transmission(s) is fully inside the shared channel occupancy indicated by the RB set(s) and up to the remaining COT duration in the COT-SI, which does not require any specification change.

* Note: The portion of the SL transmission(s) overlapping with the shared COT can be transmitted

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| < Start of text proposal >4.5.2 Type 2 SL channel access procedure This clause describes channel access procedures by UE where the time duration spanned by the sensing slots that are sensed to be idle before a SL transmission(s) is deterministic.  Type 2A SL channel access procedure as described in clause 4.5.2.1 is applicable to the following transmission(s) performed by a UE:  < Unchanged parts are omitted >  - When a UE initiates a channel occupancy on a channel to transmit SL transmission(s) within the channel occupancy, if the UE stops transmitting on the channel, the UE can resume SL transmission(s) within the channel occupancy on the channel after performing Type 2A channel access procedures as described in clause 4.5.2.1 if the UE continuously senses the channel to be idle before resuming transmission. The channel access priority class value corresponding to the resumed SL transmission(s) is at most equal to the channel access priority class for the UE to initiate the channel occupancy.  < End of text proposal > |

* FL comment: This issue and the proposed TP have been discussed in the last RAN1#116 meeting. It was pointed out that the cited “conclusion” above already clearly says “… *does not require any specification change*”. Therefore, this TP in FL’s view is not needed.

**Issue 5-2 on CAPC value for PSFCH+S-SSB [14, 38]:** For SL transmissions including PSCCH/PSSCH, when Type 1 channel access is used for COT initiation, the CAPC value is determined based on PSCCH/PSSCH as defined in 38.300. For SL transmissions including PSFCH only or S-SSB only, when Type 1 channel access is used for COT initiation, the CAPC value is always 0. However, one more case is missing. At slot n, PSFCH is transmitted, and then S-SSB transmission is transmitted at slot n+1. There is no other following transmission. Clear rule to initiate a COT for this case should be added in spec.



Note that this discussion is intended for a SL burst of PSFCH + S-SSB. CAPC = 1 is defined for ‘PSFCH-only’ and ‘S-SSB-only’, not for ‘PSFCH’ and ‘S-SSB’; this means that e.g., when SL burst include PSFCH and PSCCH/PSSCH, there is no CAPC value associated with the PSFCH rather than CAPC for the PSFCH = 1. Then, no CAPC value is decided for PSFCH + S-SSB even in the following text.

*When a UE applies Type 1 channel access procedure to initiate a channel occupancy for multiple SL transmissions over one slot or multiple consecutive slots, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for performing the Type 1 channel access procedure.*

TP from [38]:

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| < Start of text proposal >4.5 Sidelink Channel access procedure < Unchanged parts are omitted >  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including only PSFCH transmission(s), only S-SSB transmission(s), or only PSFCH and S-SSB transmission(s), the UE shall use the channel access priority class in Table 4.5-1.  < End of text proposal > |

TP from [14]:

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| < Start of text proposal >4.5 Sidelink Channel access procedure < Unchanged parts are omitted >  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including only PSFCH and/or S-SSB transmission(s), the UE shall use the channel access priority class in Table 4.5-1.  < End of text proposal > |

### Round 1 discussion

**Question 5-1 (I):** **Do you think TS 37.213 should capture the conclusion (which does not require any specification change) as brought up in Issue 5-1?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | No | As pointed out, the conclusion already stated not requiring any specification change. |
| QC | No | The text seems redundant, COT resume is anyway tackling a set of transmission within a COT for which CAPC restrictions apply. In fact, in the NR-U UL part similar to this this restriction is not redundantly reported. |
| NEC | No |  |
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**Question 5-2 (I):** **Is a correction TP needed for Issue 5-2 on CAPC value for PSFCH+S-SSB? If yes, which version of the TP [14] or [38] should be adopted?**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | OK | OK with either TP from [14] or [38]. |
| QC | Ok | [38] |
| NEC | Yes | [14] |
| CATT/CICTCI | No | As commented in the last meeting, our understanding is the following paragraph in Clause 4.5 of TS 37.213 can already cover the PSFCH+S-SSB case. Adding redundant wording is not needed.  “When a UE applies Type 1 channel access procedure to initiate a channel occupancy for multiple SL transmissions over one slot or multiple consecutive slots, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for performing the Type 1 channel access procedure.” |
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## [ACTIVE] Topic #6: Editorial corrections

**Editorial 6 for TS 38.214 [24]**: A leftover issue from RAN1#116

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| **< Start of text proposal >**  8 Physical sidelink shared channel related procedures  **< Unchanged parts are omitted >**  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the sub-channel *m* for consists of a set of *numInterlacePerSubchannel* contiguous interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211], *numSubchannel* is equal to the number of interlaces within one RB set divided by *numInterlacePerSubchannel*, and *numInterlacePerSubchannel* is given by higher layer parameter *sl-NumInterlacePerSubchannel*. The sub-channel *m* is indexed per RB set and is periodically indexed across multiple RB sets within the resource pool. The sub-channel with the same index is mapped to the set of *numInterlacePerSubchannel* interlace(s) with the same index(s) in different RB sets. The sub-channel#0 is mapped to interlaces 0 to *numInterlacePerSubchannel-1,* the subchannel #1 is mapped to interlaces *numInterlacePerSubchannel* to *numInterlacePerSubchannel\*2-1*, and so on.  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is not provided, or is set to ‘contiguousRB’, a UE is not expected to use the last PRBs in the resource pool, except when the resource pool is a dedicated SL PRS resource pool.  **< Unchanged parts are omitted >**  8.1.2.2 Resource allocation in frequency domain  **< Unchanged parts are omitted >**  For operation with shared spectrum channel access for frequency range 1, if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’,  - the lowest index of the RB set allocation to the initial PSSCH transmission is indicated via the field "Lowest index of the RB set allocation to the initial transmission" of the DCI format 3\_0.  - the starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 is indicated via the higher layer parameter *sl-StartRBsetCG-Type1*.  **< Unchanged parts are omitted >**  8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission for a carrier. To trigger this procedure, in slot *n* for this carrier*,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:  - the resource pool from which the resources are to be reported;  - L1 priority, ;  - the remaining packet delay budget;  - number of sub-channels, : If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is not provided, the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot is . If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', corresponds to the number of sub-channels within all used RB sets to be used for the PSCCH/PSSCH transmission in a slot. If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', corresponds to the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot in each RB set,  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, LRBset.  - optionally, the number of consecutive slots for multi-consecutive slots transmission, .  **< Unchanged parts are omitted >**  8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 1-A  **< Unchanged parts are omitted >**  If *sl-MaxNumPerReserve* is3 then    where  - denotes the starting sub-channel index for the second resource  - denotes the starting sub-channel index for the third resource  - is the number of sub-channels in a resource pool, or if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of sub-channels in each RB set, provided according to the higher layer parameter *sl-NumSubchannel*  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the applied interlace index(s) in different RB sets are the same.  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting RB set of the first resource is determined according to the clause 8.1.2.2. The number of contiguously allocated RB sets for each of the N resources LRBset≥1 and the starting RB set indexes of resources indicated by the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received, are determined from "Frequency resource assignment" which is equal to a frequency RIV (FRIV), where  If sl-MaxNumPerReserve is 2 then  **< End of text proposal >** |

### Round 1 discussion

**Proposal 6 (I): To adopt the editorial changes proposed in the above Editorial 6 for TS 38.214.**

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| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes |  |
| QC | Yes |  |
| NEC | YES |  |
| CATT/CICTCI | Yes with comment | The second change has already been agreed in the last meeting, i.e., ‘interlaceRB’, we may not need duplicate modification.   |  | | --- | | Agreement  Draft CR#3-1 in Section 4.1.4 of R1-2403495 is endorsed for TS 38.214.  Final CR in R1-2403669 is endorsed (Rel-18, TS 38.214, CR0548, Cat F). | |
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## [ACTIVE] Topic #7: Higher layer parameter names alignment

**Alignment 7-1 for TS 37.213 [25]:**

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| **< Start of text proposal for TS 37.213 >** 4.5 Sidelink Channel access procedures **< Unchanged parts omitted >**  Table 4.5-1: Channel Access Priority Class (CAPC) for SL   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Channel Access Priority Class () |  |  |  |  | allowed sizes | | 1 | 2 | 3 | 7 | 2 ms | {3,7} | | 2 | 2 | 7 | 15 | 4 ms | {7,15} | | 3 | 3 | 15 | 1023 | 6ms or 10 ms | {15,31,63,127,255,511,1023} | | 4 | 7 | 15 | 1023 | 6ms or 10 ms | {15,31,63,127,255,511,1023} | | NOTE1: For , if the higher layer parameter *absenceOfAnyOtherTechnology-r18* is provided, otherwise, .  NOTE 2: When it may be increased to by inserting one or more gaps. The minimum duration of a gap shall be . The maximum duration before including any such gap shall be . | | | | | |   **< Unchanged parts omitted >** 4.5.4 Contention window adjustment procedures for SL transmissions If a UE transmits a SL transmission(s) including at least one PSSCH using Type 1 channel access procedures associated with the channel access priority class on a channel, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  1) For every priority class set .  2) If a HARQ-ACK feedback corresponding to the PSSCH(s) for unicast SL transmission(s) in the reference duration for the latest channel occupancy initiated by the UE, is available:  - If the HARQ-ACK feedback includes only 'ACK', go to step 1; otherwise go to step 5.  3) If a HARQ-ACK feedback corresponding to the PSSCH(s) for groupcast SL transmission(s) in the *reference duration* for the latest channel occupancy initiated by the UE, is available:  - If *harq-ACK-FeedbackRatioforCW-AdjustmentGC-Option2-r18* is provided by higher layers:  - The UE calculates the ratio between the number of received 'ACK' in the HARQ-ACK feedback and the number of UE(s) from which the corresponding 'ACK'/'NACK' in the HARQ-ACK feedback is expected. If the calculated ratio is equal to or larger than *harq-ACK-FeedbackRatioforCW-AdjustmentGC-Option2-r18*, go to step 1; otherwise go to step 5.  - Otherwise:  - If the HARQ-ACK feedback includes at least an 'ACK',go to step 1; otherwise go to step 5.  4) If a HARQ-ACK feedback corresponding to the PSSCH(s) in the reference duration for the latest channel occupancy initiated by the UE is not available, go to step 6.  5) Increase for every priority class to the next higher allowed value.  6) For every priority class ,maintain as it is; go to step 2.  The *reference duration* in the procedure above is defined as follows:  - The *reference duration* corresponding to a channel occupancy initiated by the UE including SL transmission(s) of PSSCH(s) is defined in this clause as a duration starting from the beginning of the channel occupancy initiated by the UE including SL transmission (s) of PSSCH(s) until the end of the first slot where at least one PSSCH with HARQ-ACK feedback(s) including 'ACK'/'NACK' is transmitted.  If a UE transmits a SL transmission(s) using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission(s) is not associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s), the UE adjusts before step 1 in the procedures described in clause 4.5.1, using the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class . If the corresponding channel access priority class has not been used for any SL transmissions on the channel, is used. For the channel, if the latest value is consecutively used for X times provided by higher layers parameter *sl-CWS-ForPsschWithoutHarqAck-r18* for generation of as described in clause 4.5.1 for PSSCH transmission(s) without associated explicit HARQ-ACK feedback(s), the is increased for every priority class to the next higher allowed value.  The following applies to the procedures described in this clause for contention window adjustment:  - If , the next higher allowed value for adjusting is .  - If the is consecutively used times for generation of , is reset to only for that priority class for which is consecutively used times for generation of . is selected by UE from the set of values {1, 2, …,8} for each priority class . 4.5.5 Energy detection threshold adaptation procedure A UE accessing a channel on which SL transmission(s) are performed, shall set the energy detection threshold () to be less than or equal to the maximum energy detection threshold .  is determined as follows:  - If the UE is configured with higher layer parameter *sl-MaxEnergyDetectionThreshold-r18*,  - is set equal to the value signalled by the higher layer parameter;  - otherwise  - the UE shall determine according to the procedure described in clause 4.5.5.1;  - if the UE is configured with higher layer parameter *sl-EnergyDetectionThresholdOffset-r18*  - is set by adjusting according to the offset value signalled by the higher layer parameter;  - otherwise  - the UE shall set .  If the higher layer parameter *absenceOfAnyOtherTechnology-r18* is not configured to a UE, the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy as described in clause 4.5.3 shall use the (pre-)configured *ue-ToUE-COT-SharingED-Threshold-r18* for accessing the channel(s).  For the case where a UE performs channel access procedures as described in clause 4.5.1 for SL transmission(s) and indicates channel occupancy sharing information, is set equal to the value provided by the higher layer parameter *ue-ToUE-COT-SharingED-Threshold-r18*. 4.5.5.1 Default maximum energy detection threshold computation procedure If the higher layer parameter *absenceOfAnyOtherTechnology-r18* is provided  - where  - is Maximum energy detection threshold defined by regulatory requirements in dBm when such requirements are defined, otherwise  otherwise  -  where  In regulatory regions and bands where it is allowed,  - = ;  - =5dB for all transmissions;  - ;  Otherwise,  - ;  - if Type 2A SL channel access procedures is performed for a SL transmission(s) that initiates a channel occupancy and includes only S-SSB as described in clause 4.5.2; otherwise ;  - or in regions and bands where regulations allow,;  - is set to the value of PCMAX\_H,*c*as defined in [3];  - ;  - is the single channel bandwidth in MHz.  The higher layer parameter *absenceOfAnyOtherTechnology-r18* is not expected to be provided if the channel(s) where UE performing SL transmission(s) is overlapped with either an LAA Scell(s) on channel(s) or channel(s) where gNB/UE performing DL/UL transmission(s).  **< End of text proposal >** |

**Alignment 7-2 for TS 38.211 [26]:**

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| **< Start of text proposal for TS 38.211 >**  8.3.4.2.1 Sequence generation  The sequence shall be generated according to  where is given by clause 6.3.2.2 with the following exceptions:  - is given by clause 16.3 of [5, TS 38.213];  - is given by clause 16.3 of [5, TS 38.213];  - is given by  - if the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to '*dedicatedInterlace*' and where is the resource block number within the interlace;  - otherwise  - ;  - is the index of the OFDM symbol in the slot that corresponds to the second OFDM symbol of the PSFCH transmission in the slot given by [5, TS 38.213];  - and with given by the higher-layer parameter *sl-PSFCH-HopID* if configured; otherwise, .  - with given by the higher-layer parameter *sl-PSFCH-HopID* if configured; otherwise, .  8.3.4.2.2 Mapping to physical resources  The sequence shall be multiplied with the amplitude scaling factor in order to conform to the transmit power specified in [5, TS 38.213] and mapped in sequence starting with to resource elements assigned for transmission of the second PSFCH symbol according to clause 16.3 of [5, TS 38.213] in increasing order of the index over the assigned physical resources on antenna port.  The resource elements used for the PSFCH in the OFDM symbol in the mapping operation above shall be duplicated in the immediately preceding OFDM symbol.  If the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to ‘*dedicatedInterlace*’, the mapping operation shall be repeated for each resource block in the interlace and in the RB set over the assigned physical resource blocks according to clause 16.3 of [5, TS 38.213], with the resource-block dependent sequence generated according to clause 8.3.4.2.1.  If the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to ‘*dedicatedInterlace*’, the mapping operation shall be repeated for each resource block assigned for transmission of the common interlace and for PSFCH transmission with HARQ-ACK information over the assigned physical resource according to clause 16.3 of [5, TS 38.213], with the resource-block dependent sequence generated according to clause 8.3.4.2.1, where the cyclic shift on each resource block assigned for transmission of the common interlace is up to UE implementation.  **< End of text proposal >** |

**Alignment 7-3 for TS 38.212 [27]:**

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| **< Start of text proposal for TS 38.212 >**  7.3.1.4.1 Format 3\_0  **< Unchanged parts are omitted >**  - Lowest index of the RB set allocation to the initial transmission - bits as defined in Clause 8.1.2.2 of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  **< Unchanged parts are omitted >**  8.3.1.1 SCI format 1-A  **< Unchanged parts are omitted >**  - Frequency resource assignment - number of bits determined by the following:  - If higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured or configured to ‘contigousRB’  - bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 2; otherwise bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 3, as defined in clause 8.1.5 of [6, TS 38.214].  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to ‘interlaceRB’  - X + Y bits provide the frequency domain resource allocation according to Clause x.x of [6, TS 38.214], where the X MSBs provide the RB set allocation and the Y LSBs provide the sub-channel allocation,  **< Unchanged parts are omitted >**  - bits as configured by higher layer parameter *sl-NumReservedBits,* with value set to zero, if higher layer parameter *sl-IndicationUE-B* is not configured, or if higher layer parameter *sl-IndicationUE-B* is configured to 'disabled', and if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured;  - bits if higher layer parameter *sl-IndicationUE-B* is configured to 'enabled', and if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured, with value set to zero.  - bits otherwise, with value set to zero.  - COT sharing flag – 0 or 1 bit  - 1 bit as defined in [14, TS 37.213] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured;  - 0 bit otherwise.- Conflict information receiver flag - 0 or 1 bit  - 1 bit if higher layer parameter *sl-IndicationUE-B* is configured to 'enabled', where the bit value of 0 indicates that the UE cannot be a UE to receive conflict information and the bit value of 1 indicates that the UE can be a UE to receive conflict information as defined in Clause 16.3.0 of [5, TS 38.213];  - 0 bit otherwise.  Table 8.3.1.1-1: 2nd-stage SCI formats   |  |  | | --- | --- | | Value of 2nd-stage SCI format field | 2nd-stage SCI format | | 00 | SCI format 2-A | | 01 | SCI format 2-B; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured | | 10 | SCI format 2-C; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured and the COT sharing flag field is set to '1' | | 11 | SCI format 2-D; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured |   **< Unchanged parts are omitted >**  8.4.1.1 SCI format 2-A  **< Unchanged parts are omitted >**  Table 8.4.1.1-1: Cast type indicator or COT sharing cast type   |  |  | | --- | --- | | **Value of Cast type indicator or COT sharing cast type** | **Cast type** | | 00 | Broadcast | | 01 | Groupcast  when HARQ-ACK information includes ACK or NACK | | 10 | Unicast | | 11 | Groupcast  when HARQ-ACK information includes only NACK; or  reserved, if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured |   8.4.1.3 SCI format 2-C  **< Unchanged parts are omitted >**  If the 'Providing/Requesting indicator' field is set to 0, all the remaining fields are set as follows:  - Resource combinations -number of bits determined by the following:  - If higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured or configured to 'contigousRB'  - bits as defined in Clause 8.1.5A of [6, TS 38.214];  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'  - bits as defined in Clause 8.1.5A of [6, TS 38.214];  **< Unchanged parts are omitted >**  - Lowest RB set indices - bits as defined in Clause 8.1.5A of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  If the 'Providing/Requesting indicator' field is set to 1, all the remaining fields are set as follows:  - Priority - 3 bits as specified in clause 5.4.3.3 of [12, TS 23.287] and clause 5.22.1.3.1 of [8, TS 38.321]. Value '000' of Priority field corresponds to priority value '1', value '001' of Priority field corresponds to priority value '2', and so on.  - Number of subchannels - bits as defined in Clause 8.1.4A of [6, TS 38.214].  - Number of RB sets - bits as defined in Clause 8.1.4A of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  **< Unchanged parts are omitted >**  8.4.4 Rate Matching  **< Unchanged parts are omitted >**  - is the number of resource elements that can be used for transmission of the 2nd-stage SCI in OFDM symbol , for and for , in PSSCH transmission, where = *sl-lengthSymbols* - 2, where *sl-lengthSymbols* is the number of sidelink symbols within the slot provided by higher layers as defined in [6, TS 38.214]. is the number of symbols for SL PRS provided by the higher layer parameter *numSym-SL-PRS-2ndStageSCI* if the 2nd-stage SCI is SCI format 2-D, and = 0 otherwise. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, = *sl-NumRefSymbolLength* - 2, where *sl-NumRefSymbolLength* is provided by higher layers. If higher layer parameter *sl-PSFCH-Period* = 2 or 4, = 3 if "PSFCH overhead indication" field of SCI format 1-A indicates "1", and = 0 otherwise. If higher layer parameter *sl-PSFCH-Period* = 0, . If higher layer parameter *sl-PSFCH-Period* is 1, .  **< End of text proposal >** |

**Alignment 7-4 for TS 38.213 [17, 28]:**

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| --- |
| **< Start of text proposal for TS 38.213 >**  16.1 Synchronization procedures  **< Unchanged parts are omitted >**  For reception of a S-SS/PSBCH block,  - for operation without shared spectrum channel access, or for operation with shared spectrum channel access and when *sl-NumOfSSSBRepetition* is not provided and for RB-set , a UE assumes a frequency location corresponding to the subcarrier with index 66 in the S-SS/PSBCH block [4, TS 38.211], is provided by  - *sl-AbsoluteFrequencySSB*, for operation without shared spectrum channel access or when RB-set is the anchor RB-set that is the RB set that includes the S-SS/PSBCH block  - a corresponding value in *sl-AbsoluteFrequencySSB-NonAnchorList* when RB-set is a non-anchor RB-set  - for operation with shared spectrum channel access when *sl-NumOfSSSBRepetition* is provided and in RB-set , a UE assumes a frequency location corresponding to the subcarrier with index 66 in the S-SS/PSBCH block [4, TS 38.211] is provided by +, where  - is a frequency location of a lowest S-SS/PSBCH block in RB-set , where is provided by  - *sl-AbsoluteFrequencySSB* when RB-set *j* is the anchor RB-set,  - a corresponding value in *sl-AbsoluteFrequencySSB-NonAnchorList* when RB-set is a non-anchor RB-set  - is an index of an S-SS/PSBCH block from repeated S-SS/PSBCH blocks in the frequency domain and within the RB-set , where , and is provided by a value in *sl-NumOfSSSBRepetition* corresponding to RB-set ;  - is a number of resource blocks, provided by *sl-GapBetweenSSSBRepetition*, for a gap between two adjacent repeated S-SS/PSBCH blocks;  - is a number of resource blocks for a S-SS/PSBCH block transmission with SCS configuration .  **< End of text proposal >** |

**Alignment 7-5 for TS 38.214 [18, 29]:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **< Start of text proposal for TS 38.214 >**  7 UE procedures for transmitting and receiving on a carrier with intra-cell guard bands  For operation with shared spectrum channel access for FR1, when the UE is configured with any of *IntraCellGuardBandsPerSCS* for UL carrier and for DL carrier and *sl-IntraCellGuardBandsSL-List* for SL carrier with SCS configuration , the UE is provided with intra-cell guard bands on a carrier with , each defined by start CRB and size in number of CRBs, and , provided by higher layer parameters *startCRB* and *nrofCRBs*, respectively, where . The subscript *x* is set to DL, UL, or SL for the downlink, uplink, or sidelink, respectively. Where there is no risk of confusion, the subscript *x* can be dropped. The intra-cell guard bands separate RB sets, each defined by start and end CRB, and , respectively. The UE does not expect that *nrofCRBs* is configured with non-zero value smaller than the applicable intra-cell guard bands as specified in [8, TS 38.101-1] corresponding to and carrier size . The UE determines the start and end CRB indices for as    and    The RB set with index consists of resource blocks where . When the UE is not configured with *IntraCellGuardBandsPerSCS* for UL carrier and for DL carrier with SCS configuration , or is not configured with *sl-IntraCellGuardBandsSL-List* for SL carrier with SCS configuration , the UE determines the CRB indices for the intra-cell guard band(s), if any, and corresponding RB set(s) according to the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] corresponding to and carrier size . For any one or more of DL, UL, SL, if the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] contains no intra-cell guard bands, the number of RB sets for the carrier is .  **< Unchanged parts are omitted >**  8 Physical sidelink shared channel related procedures  **< Unchanged parts are omitted >**  In the frequency domain,  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to 'contiguousRB', a sidelink resource pool consists of *sl-NumSubchannel* contiguous sub-channels. A sub-channel consists of *sl-SubchannelSize* contiguous PRBs, where *sl-NumSubchannel* and *sl-SubchannelSize* are higher layer parameters.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', in the frequency domain, each RB set of a sidelink resource pool consists of integer number of sub-channels, where each sub-channel consists of *sl-NumInterlacePerSubchannel* interlaces having contiguous interlace indices.  For operation with shared spectrum channel access for frequency range 1, a sidelink resource pool can be (pre-)configured to include integer number of RB sets, and the lowest RB of the sidelink resource pool is aligned with the lowest RB of lowest RB set in the resource pool, and the highest RB of the sidelink resource pool is aligned with the highest RB of highest RB set in the resource pool. A UE can be configured with intra-cell guard bands according to the higher layer parameter *sl-IntraCellGuardBandsSL-List*. The configured intra-cell guard band PRBs between any two adjacent RB sets can be used only for PSSCH transmission, if and only if, the UE has successfully performed channel access procedure in both adjacent RB sets, and the UE uses both of these RB sets for PSSCH transmission. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', and if more than 1 sub-channel is used for PSSCH transmission, when the highest sub-channel of PSSCH overlaps with a single RB set and intra-cell guard band PRBs, the UE can transmit PSSCH on the PRBs belonging to the allocated sub-channel(s) except for the intra-cell guard band PRBs within the highest sub-channel.  **< Unchanged parts are omitted >**  The UE determines the set of resource blocks assigned to a sidelink resource pool as follows:  - The resource block pool consists of PRBs.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or is set to 'contiguousRB', the sub-channel *m* for consists of a set of contiguous resource blocks with the physical resource block number for , where , and *numSubchannel* are given by higher layer parameters *sl-StartRB-Subchannel*, *sl-SubchannelSize* and *sl-NumSubchannel*, respectively.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the sub-channel *m* for consists of a set of *sl-NumInterlacePerSubchannel* contiguous interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211], *numSubchannel* is equal to the number of interlaces within one RB set divided by *sl-NumInterlacePerSubchannel*, and *sl-NumInterlacePerSubchannel* is given by higher layer parameter *sl-NumInterlacePerSubchannel*. The sub-channel *m* is indexed per RB set and is periodically indexed across multiple RB sets within the resource pool. The sub-channel with the same index is mapped to the set of *sl-NumInterlacePerSubchannel* interlace(s) with the same index(s) in different RB sets. The sub-channel#0 is mapped to interlaces 0 to *sl-NumInterlacePerSubchannel -1,* the subchannel #1 is mapped to interlaces *sl-NumInterlacePerSubchannel* to *sl-NumInterlacePerSubchannel \*2-1*, and so on.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or is set to ‘contiguousRB’, a UE is not expected to use the last PRBs in the resource pool, except when the resource pool is a dedicated SL PRS resource pool.  **< Unchanged parts are omitted >**  8.1 UE procedure for transmitting the physical sidelink shared channel  **< Unchanged parts are omitted >**  - if '*Providing/Requesting indicator*' indicates SCI format 2-C is used to convey an explicit request for inter-UE coordination information:  - the UE shall set value of the '*Priority*' field as indicated by higher layers.  - the UE shall set value of the '*Number of subchannels*' field as indicated by higher layers.  - the UE shall set value of the '*Number of RB sets*' field as indicated by higher layers if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'.  - the UE shall set value of the '*Resource reservation period*' field as indicated by higher layers.  - the UE shall set value of the '*Resource selection window location*' field as indicated by higher layers.  - the UE shall set value of the '*Resource set type*' field as indicated by higher layers if higher layer parameter *sl-DetermineResourceType* is configured to 'UE-B's request'; otherwise this field is omitted.  - if '*Providing/Requesting indicator*' indicates SCI format 2-C is used to convey inter-UE coordination information:  - the UE shall set value of the '*Resource set type*' field as indicated by higher layers.  - the UE shall set value of the '*Resource combination(s)*' field (clause 8.1.5A) as indicated by higher layers.  - the UE shall set value of the *'Lowest subchannel indices'* as indicated by higher layers  - the UE shall set value of the *'Lowest RB set indices'* as indicated by higher layers if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'.  - the UE shall set value of the '*First resource location*' as indicated by higher layers  - the UE shall set value of the '*Reference slot location*' as indicated by higher layers  **< Unchanged parts are omitted >**  8.1.2.1 Resource allocation in time domain  **< Unchanged parts are omitted >**  The UE shall transmit the PSSCH in consecutive symbols within the slot, subject to the following restrictions:  - The UE shall not transmit PSSCH in symbols which are not configured for sidelink. A symbol is configured for sidelink, according to higher layer parameters *sl-StartSymbol* and *sl-LengthSymbols*, where *sl-StartSymbol* is the symbol index of the first symbol of *sl-LengthSymbols* consecutive symbols configured for sidelink.  - Within the slot, PSSCH resource allocation starts at symbol *sl-StartSymbol+1,* except when *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for a SL-BWP*.* If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, there are 2 candidate starting symbols, given by *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* respectively, for PSSCH transmission for slots without PSFCH symbols; and there is one starting symbol, given by *sl-StartingSymbolFirst,* for PSSCH transmission for slots with PSFCH symbols. PSSCH resource allocation starts at the next symbol after each candidate starting symbol. In a slot, the UE may use the second candidate starting symbol, provided by *sl-StartingSymbolSecond*, only if it fails to access the channel prior to the first candidate starting symbol provided by *sl-StartingSymbolFirst.*  - The UE shall not transmit PSSCH in symbols which are configured for use by PSFCH, if PSFCH is configured in this slot.  - The UE shall not transmit PSSCH in the last symbol configured for sidelink.  - The UE shall not transmit PSSCH in the symbol immediately preceding the symbols which are configured for use by PSFCH, if PSFCH is configured in this slot.  - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission with PSSCH/PSCCH by a UE to initiate a channel occupancy for a slot, if no resource reservation is transmitted or detected for the slot and any one of the RB set(s) of the intended PSCCH/PSSCH transmission, and if UE is configured with multiple CPE starting positions provided by *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-List,* the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the PSCCH/PSSCH by the higher layer parameter *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-List*. Otherwise, the UE uses a configured default cyclic prefix extension *Text* indicated by *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-Default*.  - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission with PSSCH/PSCCH by a UE within a channel occupancy*,* the UE transmitting in the channel occupancy determines the duration of a cyclic prefix extension *Text* according to higher layer parameter *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-Default*, unless the UE is configured with multiple CPE starting positions for transmitting within a shared channel occupancy by *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-List,* in which case the UE determines the duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the PSCCH/PSSCH by the higher layer parameter *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-List,* if no resource reservation is transmitted or detected for the slot and the RB set(s) of the intended PSCCH/PSSCH transmission, otherwise, the UE uses the configured default cyclic prefix extension *Text* indicated by *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-Default.*  - For operation with shared spectrum channel access in frequency range 1, for a PSSCH/PSCCH transmission by a UE that follows another SL transmission by the same UE in a channel occupancy, the UE determines the duration of a cyclic prefix extension *Text* as follows:  - When gap between the PSSCH/PSCCH transmission and the previous SL transmission is 1 symbol, the index *i* for is set to '1'.  - When gap between the PSSCH/PSCCH transmission and the previous SL transmission is 2 symbols, the index *i* for is set to '3' for µ=1 and to '2' for µ=2.  **< Unchanged parts are omitted >**  8.1.2.2 Resource allocation in frequency domain  **< Unchanged parts are omitted >**  For operation with shared spectrum channel access for frequency range 1, if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB:  - the lowest index of the RB set allocation to the initial PSSCH transmission is indicated via the field "Lowest index of the RB set allocation to the initial transmission" of the DCI format 3\_0.  - the starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 is indicated via the higher layer parameter *sl-StartRBsetCG-Type1*.  **< Unchanged parts are omitted >**  8.1.3.2 Transport block size determination  For the PSSCH assigned by SCI, if Table 5.1.3.1-2 is used and *,* or a table other than Table 5.1.3.1-2 is usedand *,* the UE shall first determine the TBS as specified below:  The UE shall first determine the number of REs (*NRE*) within the slot.  - A UE first determines the number of REs allocated for PSSCH within a PRB () by , where  - is the number of subcarriers in a physical resource block,  - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, the number of sidelink symbols assumed in transport block size determination is determined by a reference number of symbols, *sl-NumRefSymbolLength*, provided by higher layers, such that *sl-NumRefSymbolLength* replaces *sl-LengthSymbols* in calculation of .  - = 3 if '*PSFCH overhead indication'* field of SCI format 1-A indicates "1", and = 0 otherwise, if higher layer parameter *sl-PSFCH-Period* is 2 or 4. If higher layer parameter *sl-PSFCH-Period* is 0, . If higher layer parameter *sl-PSFCH-Period* is 1, .  - is the number of OFDM symbols used for SL PRS in the slot as indicated by the ‘*SL PRS resource ID*’ in SCI format 2-D if the 2nd-stage SCI is SCI format 2-D, and , otherwise.,  - is the overhead given by higher layer parameter *sl-X-Overhead*,  - is given by Table 8.1.3.2-1 according to higher layer parameter *sl-PSSCH-DMRS-TimePatternList.*  Table 8.1.3.2-1: according to higher layer parameter *sl-PSSCH-DMRS-TimePatternList*   |  |  | | --- | --- | | *sl-PSSCH-DMRS-TimePatternList* |  | | {2} | 12 | | {3} | 18 | | {4} | 24 | | {2,3} | 15 | | {2,4} | 18 | | {3,4} | 21 | | {2,3,4} | 18 |   - A UE determines the total number of REs allocated for PSSCH () by , where  - *nPRB* is the total number of allocated PRBs for the PSSCH. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', a reference number of PRBs (*nref*) per interlace within 1 RB set, *sl-NumReferencePRBs-OfInterlace*, is provided by higher layers for determination of total number of PRBs for PSSCH, that is *nPRB = nref \* ninter,subCH \* nsubCH \* nRB-set,* where *ninter,subCH* is given by the higher layer parameter *sl-NumInterlacePerSubchannel, nsubCH* is the number of occupied sub-channels within one RB set for the PSSCH, and *nRB-set* is the number of occupied RB sets for the PSSCH. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB’, *nPRB =*  *\* nsubCH ,* where is provided by higher layer parameter *sl-SubchannelSize*, and *nsubCH* is the number of occupied sub-channels for the PSSCH.  - is the total number of REs occupied by the PSCCH and PSCCH DM-RS.  - is the number of coded modulation symbols generated for 2nd-stage SCI transmission (prior to duplication for the 2nd layer, if present) according to Clause 8.4.4 of [5, TS 38.212], with the assumption of .  **< Unchanged parts are omitted >**  8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission for a carrier. To trigger this procedure, in slot *n* for this carrier*,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:  - the resource pool from which the resources are to be reported;  - L1 priority, ;  - the remaining packet delay budget;  - number of sub-channels, : If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot is . If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', corresponds to the number of sub-channels within all used RB sets to be used for the PSCCH/PSSCH transmission in a slot. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', corresponds to the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot in each RB set,  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, LRBset.  - optionally, the number of consecutive slots for Multi-consecutive slots transmission, .  **< Unchanged parts are omitted >**  The following steps are used:  1) If a number of consecutive slots is provided with a value larger than 1, the candidate multi-slot resource definition is applied. Otherwise, the candidate single-slot resource definition is applied.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', a candidate multi-slot resource is defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot , when the set of slots that are consecutive in physical slots.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', a candidate multi-slot resourceis defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot in contiguous RB sets starting from RB set z, when the set of slots that are consecutive in physical slots. A candidate single-slot resource is defined as a set of contiguous sub-channels starting from sub-channel in slot in contiguous RB sets starting from RB set z.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided or if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB’, a candidate single-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* in slot where .  The UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets included in the corresponding resource pool within the time interval correspond to one candidate single-slot resource or the UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets in consecutive slots included in the corresponding resource pool within the time interval correspond to one candidate multi-slot resource for UE performing full sensing. The UE shall assume that any set of contiguous sub-channels included in the corresponding resource pool in a set of *Y* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing periodic-based partial sensing together with contiguous partial sensing and resource (re)selection triggered by periodic transmission (), or in a set of *Y'* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (), where  - selection of is up to UE implementation under , where is defined in slots in Table 8.1.4-2 where is the SCS configuration of the SL BWP;  - if is shorter than the remaining packet delay budget (in slots) then is up to UE implementation subject to remaining packet delay budget (in slots); otherwise is set to the remaining packet delay budget (in slots).  - is selected by UE where .  - is selected by UE where . When the UE performs at least contiguous partial sensing and if , the UE selects a set of candidate slots with corresponding PBPS and/or CPS results (if available). If the number of candidate slots is smaller than , it is up to UE implementation to include other candidate slots.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', the UE shall exclude candidate single-slot or candidate multi-slot resources with the sub-channel with the smallest index including resource blocks of the intra-cell guardband PRBs, configured by higher layer parameter, *sl-IntraCellGuardBandsSL-List*, or determined according to the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] when higher layer parameter, *sl-IntraCellGuardBandsSL-List*, is not configured.  **< Unchanged parts are omitted >**  8.1.4A UE procedure for determining a set of preferred or non-preferred resources for another UE's transmission  When this procedure is triggered, the following parameters are provided by the higher layer:  - the resource pool from which the preferred or non-preferred resources are to be determined;  - the resource selection window within which the preferred or non-preferred resources are to be determined;  - the resource set type (either preferred or non-preferred resource set);  - if the resource set type indicates preferred set, then the higher layer additionally provides the following parameters:  - L1 priority, ;  - the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ;  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, *LRBset*;  - the resource reservation period, , if present.  **< Unchanged parts are omitted >**  8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 1-A  **< Unchanged parts are omitted >**  If *sl-MaxNumPerReserve* is3 then    where  - denotes the starting sub-channel index for the second resource  - denotes the starting sub-channel index for the third resource  - is the number of sub-channels in a resource pool, or if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of sub-channels in each RB set, provided according to the higher layer parameter *sl-NumSubchannel*  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the applied interlace index(s) in different RB sets are the same.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting RB set of the first resource is determined according to the clause 8.1.2.2. The number of contiguously allocated RB sets for each of the N resources LRBset≥1 and the starting RB set indexes of resources indicated by the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received, are determined from "Frequency resource assignment" which is equal to a frequency RIV (FRIV) where.  If sl-MaxNumPerReserve is 2 then  If sl-MaxNumPerReserve is 3 then  where  - denotes the starting RB set index for the second resource,  - denotes the starting RB set index for the third resource,  - is the number of RB sets in a resource pool,  - is the number of RB sets for each of the indicated resources,  - for FRIV indication, within the resource pool, RB sets are numbered in increasing order from 0 to from lowest frequency location to highest frequency location.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the resource is determined by an intersection of the interlaces corresponding to the indicated sub-channel(s) and the union of the indicated set of RB sets and intra-cell guard bands between the indicated RB sets, if any.  If TRIV indicates *N* < *sl-MaxNumPerReserve*,  - if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting sub-channel indexes and the starting RB set indexes corresponding to *sl-MaxNumPerReserve* minus *N* last resources are not used.  - otherwise, the starting sub-channel indexes corresponding to *sl-MaxNumPerReserve* minus *N* last resources are not used.  **< Unchanged parts are omitted >**  8.1.5A UE procedure for determining slots and resource blocks indicated by a preferred or non-preferred resource set  The set of slots and resource blocks indicated by a set of preferred or non-preferred resource(s) is determined as described below.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to ‘contiguousRB', the set of preferred or non-preferred resources , is indicated by a reference slot and tuples , indicated by the 'resource combination' field, where for each tuple is indicated by the 9 MSBs, followed by and (if present).  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', the set of preferred or non-preferred resources , is indicated by a reference slot and tuples , indicated by the 'resource combination' field, where for each tuple is indicated by the 9 MSBs, followed by , and (if present).  The reference slot is indicated by the 'Reference slot location' field as a combination of DFN index and slot index [5, TS 38.212], with the 10 MSBs indicating the DFN index. , and if any are interpreted according to clause 8.1.5, with the following modifications:  - the value of *sl-MaxNumPerReserve* is fixed to 3.  - "slot where SCI format 1-A was received" is replaced by slot indicated as the first resource location of a .  - the first resource location of each for is indicated by a slot offset in logical slots with respect to the reference slot ; the slot offset is indicated by the 'first resource location' field; the first resource location of is at slot offset 0 with respect to the reference slot.  - "the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received" is replaced by "each tuple".  - the starting sub-channel of the first resource of each tuple is separately indicated.  - if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', the starting RB set of the first resource of each tuple is separately indicated.  The starting sub-channel of the first resource of each tuple is indicated by the 'Lowest subChannel indices' field. The starting RB set of the first resource of each tuple, if any, is indicated by the 'Lowest RB set indices' field. The resource reservation period is encoded as in SCI format 1-A.  If the set is indicated by an SCI format 2-C, the number of tuples is .  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to ‘contiguousRB', a UE forms the union of the subsets indicated by each tuple to obtain the set .  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', a UE forms the union of the subsets indicated by each tuple to obtain the set .  **< Unchanged parts are omitted >**  8.3 UE procedure for receiving the physical sidelink shared channel  For sidelink resource allocation mode 1, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B, 2-C and 2-D, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.  For sidelink resource allocation mode 2, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B, 2-C and 2-D, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.  A UE is required to decode neither the corresponding SCI formats 2-A, 2-B, 2-C nor the PSSCH associated with an SCI format 1-A if the SCI format 1-A indicates an MCS table that the UE does not support.  In any slot without PSFCH symbols, the UE attempts, subject to UE capability, to decode PSSCH transmission starting from the second candidate starting symbol provided by *sl-StartingSymbolSecond*, if *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided.  **< End of text proposal >** |

**Alignment 7-6 for TS 38.215 [30]:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **< Start of text proposal for TS 38.215 >**   |  |  | | --- | --- | | **Definition** | Sidelink Received Signal Strength Indicator (SL RSSI) is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of a slot configured for PSCCH and PSSCH, starting from the 2nd OFDM symbol. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for a SL bandwidth part, for a slot with PSFCH symbols, SL RSSI is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of the slot configured for PSCCH and PSSCH, starting from the next OFDM symbol of the first candidate starting symbol, given by *sl-StartingSymbolFirst*, and for a slot without PSFCH symbols, SL RSSI is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of the slot configured for PSCCH and PSSCH, starting from the next OFDM symbol of the second candidate starting symbol, provided by *sl-StartingSymbolSecond*.  For frequency range 1, the reference point for the SL RSSI shall be the antenna connector of the UE. For frequency range 2, SL RSSI shall be measured based on the combined signal from antenna elements corresponding to a given receiver branch. For frequency range 1 and 2, if receiver diversity is in use by the UE, the reported SL RSSI value shall not be lower than the corresponding SL RSSI of any of the individual receiver branches. | | **Applicable for** | Sidelink |   **< End of text proposal >** |

### Round 1 discussion

**Proposal 7 (I): Do you agree to adopt all the higher layer parameter names alignment proposals in the above Alignment 7-1 to 7-6?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes |  |
| QC | Yes |  |
| NEC | Yes |  |
| CATT/CICTCI | Yes | But we may need to wait for RAN2’s LS on higher layer parameter list? |
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## [ACTIVE] Topic #8: Incoming RAN2 LS on sidelink feature co-configuration

**Background [43]**: RAN2 has discussed the feasibility of co-configuring SL features, and reached the following agreements in RAN2#125bis:

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| --- |
| From R2 perspective, UE is not expected to be (pre)configured with 1) both partial sensing and Co-Ex in the same resource pool, 2) both random-selection and Co-Ex in the same resource pool, in Rel-18.  From R2 perspective, UE is not expected to be (pre)configured to perform partial sensing operation over an unlicensed spectrum using interlace RB based transmission, in Rel-18.  From R2 perspective, UE is not expected to be (pre)configured with a LTE/NR-SL co-existence resource pool over an unlicensed spectrum, in Rel-18. |

RAN2 also agreed that "we don’t need to capture them in the spec. We can leave them into network implementation."

**Issue 8-1 [44-50]**: UE is not expected to be (pre)configured with 1) both partial sensing and Co-Ex in the same resource pool, 2) both random-selection and Co-Ex in the same resource pool, in Rel-18.

* No concern has been raised (RAN1 agrees with RAN2’s agreement): [45] [46] [47] [48] [49]
  + [46] suggests some description of UE behaviour should be captured in the sensing procedure in TS 38.214 to avoid unexpected UE behaviour as: *In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink, the UE is not expected to be (pre)configured partial sensing or random selection by higher layer.*
  + [47] [48] is OK with 1) both partial sensing and Co-Ex in the same resource pool, but not 2)
* Concern with RAN2’s agreement:
  + [47] [48]: On 2), from LTE SL to NR SL, the exceptional resource pool is (pre-)configured to handle some exceptional cases (e.g., UE has no enough sensing result at the very beginning after power on). And UE performs random selection in the exceptional resource pool. More specifically, UE ought to select the resources in the first of NR SL slots overlapping with an LTE SL subframe and may select the resources in the second of NR SL slots overlapping with an LTE SL subframe to address the AGC issue when the UE performs random selection for co-channel coexistence.
  + [44] proposes RAN2 to further clarify that
    - On 1), Whether this agreement applies to NR SL only, or both NR and LTE SL. In other words, does it preclude the configuration of LTE SL UE with partial sensing/random-selection coexists with NR SL UE in the same resource pool, or NR SL UE with partial sensing/random-selection coexists with LTE SL UE, or both?
    - On 2), regarding the random-selection case, RAN1 would like RAN2 to clarify whether it includes only the random-selection scheme for Rel-17 power saving, or also the Rel-16 random-selection (e.g., for the exceptional pool).

**Issue 8-2 [39, 44-49]**: UE is not expected to be (pre)configured to perform partial sensing operation over an unlicensed spectrum using interlace RB based transmission, in Rel-18.

* No concern has been raised (RAN1 agrees with RAN2’s agreement): [46] [47] [48]
  + [46] suggests some description of UE behaviour should be captured in the sensing procedure in TS 38.214 to avoid unexpected UE behaviour as: *If the higher layer parameter sl-TransmissionStructureForPSCCHandPSSCH is set to 'interlaceRB', UE is not expected to be (pre)configured to perform partial sensing by higher layer.*
* Not aligned with RAN1’s understanding / expectation:
  + [39]: Although RAN2 LS [1] includes their agreement that partial sensing and interlaced RB-based TX are not (pre-)configured simultaneously, it is not aligned with RAN1 discussion. RAN1 never precludes such a combination so far. Rather, in UE feature discussion, it seems that the combination is allowed.
  + [44]: RAN1 assumed that a UE is possible to perform partial sensing and random selection over an unlicensed spectrum, and designed the UE features based on this assumption. If RAN2 observes some issues to support such kind of operation, some UE features (e.g., the prerequisites) may be modified.
  + [45]: According to the previous RAN1 discussion, resource allocation operation before Rel-18, including partial sensing, applies to unlicensed spectrum automatically, and necessary modifications have already been added in RAN1 specification. For partial sensing operation in SL-U, there is no specific difference on the sensing behaviour between contiguous RB-based transmission and interlaced RB-based transmission. Therefore, it is RAN1’s understanding that (pre-)configuring partial sensing on unlicensed spectrum is allowed even for interlaced RB-based transmission.
  + [49]: Interlace RB based transmission is supported in Rel-18 SL-U. Either a UE uses partial sensing or full sensing is decoupled from transmission structure, i.e., there is no problem that a UE uses partial sensing to select resource and uses interlace RB structure to transmit PSCCH/PSSCH. UE procedure for resource determination via partial sensing in clause 8.1.4 of TS 38.214 can apply to unlicensed spectrum directly, i.e., there is no specification impact. Therefore, we have concern on the second RAN2 agreement and support that a UE can be (pre-)configured to perform partial sensing operation over an unlicensed spectrum using interlace RB based transmission in Rel-18.

**Issue 8-3 [44-49]**: UE is not expected to be (pre)configured with a LTE/NR-SL co-existence resource pool over an unlicensed spectrum, in Rel-18.

* No concern has been raised (RAN1 agrees with RAN2’s agreement): [44] [45] [46] [47] [48] [49]

### Round 1 discussion

**Question 8-1-1 (I): Based on contributions submitted to this meeting, 4 companies have no concern while 1 company would like to ask for clarification on RAN2’s first agreement point 1) in the LS on “**From R2 perspective, UE is not expected to be (pre)configured with 1) both partial sensing and Co-Ex in the same resource pool, in Rel-18.**” More specifically, the proposed clarification question is**

*Whether this agreement applies to NR SL only, or both NR and LTE SL. In other words, does it preclude the configuration of LTE SL UE with partial sensing/random-selection coexists with NR SL UE in the same resource pool, or NR SL UE with partial sensing/random-selection coexists with LTE SL UE, or both?*

**Do you agree to ask the above clarification question to RAN2?**

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| **Company** | **Comments** |
| OPPO | No, we think the discussion is about the co-configuration of NR SL features and no clarification is needed. In our understanding, it only precludes NR SL UE with partial sensing/random-selection coexists with LTE SL UE. |
| NEC | Same view with OPPO |
| CATT/CICTCI | Share similar understanding as OPPO, and clarification seems not needed. |
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**Question 8-1-2 (I): Based on contributions submitted to this meeting, 3 companies have no concern while 1 company disagrees and 1 company would like to ask for clarification on RAN2’s first agreement point 2) in the LS on “**From R2 perspective, UE is not expected to be (pre)configured with 2) both random-selection and Co-Ex in the same resource pool, in Rel-18.**” More specifically, the proposed clarification question is**

*whether it includes only the random-selection scheme for Rel-17 power saving, or also the Rel-16 random-selection (i.e., for the exceptional pool)?*

**Do you agree to ask the above clarification question to RAN2?**

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| **Company** | **Comments** |
| OPPO | Yes. An exceptional NR SL resource pool is always needed to handle exceptional cases. Therefore, co-channel coexistence should be taken into consideration during random resource selection within the exceptional resource pool. |
| CATT/CICTCI | We agree with RAN2’s agreement.  For the exceptional pool, we think it is clear that the pool is not the resource pool RAN2 mentioned in the agreement. Even if random -selection and Co-Ex are not (pre)configured in the same resource pool, the behaviour of performing random selection in an exceptional pool is still allowed. |
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**Question 8-2 (I): Based on contributions submitted to this meeting, 2 companies have no concern while 3 companies have raised concerns on RAN2’s second agreement in the LS on “**From R2 perspective, UE is not expected to be (pre)configured to perform partial sensing operation over an unlicensed spectrum using interlace RB based transmission, in Rel-18.**” The moderator would like to gather more views on this RAN2 agreement.**

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| **Company** | **Comments** |
| OPPO | According to section 8.1.4 of TS 38.214, only the description of single-slot candidate resource for contiguous-RB based transmission is defined in partial sensing, which can be seen in the yellow highlight as below. In other words, the definition of single-slot or multi-slot candidate resource for interlace-RB based transmission is missing in partial sensing. Therefore, the interlace-RB based transmission is not supported in partial sensing according to RAN1’s specification right now. We think this is also why RAN2 achieves the agreement that partial sensing and interlace-RB based transmission are not configured simultaneously. Therefore, we have no concern with RAN2’s agreement on this co-configuration.  TS 38.214:  *The UE shall assume that any set of contiguous sub-channels included in the corresponding resource pool in a set of Y candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing periodic-based partial sensing together with contiguous partial sensing and resource (re)selection triggered by periodic transmission (), or in a set of Y' candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (),* |
| NEC | We have no concerns regarding R2’s agreement on IRB based transmission |
| CATT/CICTCI | According to current RAN1 spec, partial sensing is already supported on unlicensed spectrum. And there is no specific difference on the sensing behaviour between contiguous RB-based transmission and interlaced RB-based transmission. Therefore, our understanding is that (pre-)configuring partial sensing on unlicensed spectrum is allowed even for interlaced RB-based transmission. |
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**Question 8-3 (I): Based on contributions submitted to this meeting, there has been no concern raised on RAN2’s third agreement in the LS on “From R2 perspective, UE is not expected to be (pre)configured with a LTE/NR-SL co-existence resource pool over an unlicensed spectrum, in Rel-18.” Is it everyone’s understanding that there is no concern on this RAN2’s agreement?**

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| **Company** | **Comments** |
| OPPO | No concern on the 3rd agreement in RAN2 LS |
| NEC | No concerns |
| CATT/CICTCI | No concern |
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Corresponding text proposals (TPs)

## TP#1: Editorial corrections for TS 38.214 V18.2.0

### Proposal v1

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| --- |
| **< Start of text proposal >**  8 Physical sidelink shared channel related procedures  **< Unchanged parts are omitted >**  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the sub-channel *m* for consists of a set of *numInterlacePerSubchannel* contiguous interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211], *numSubchannel* is equal to the number of interlaces within one RB set divided by *numInterlacePerSubchannel*, and *numInterlacePerSubchannel* is given by higher layer parameter *sl-NumInterlacePerSubchannel*. The sub-channel *m* is indexed per RB set and is periodically indexed across multiple RB sets within the resource pool. The sub-channel with the same index is mapped to the set of *numInterlacePerSubchannel* interlace(s) with the same index(s) in different RB sets. The sub-channel#0 is mapped to interlaces 0 to *numInterlacePerSubchannel-1,* the subchannel #1 is mapped to interlaces *numInterlacePerSubchannel* to *numInterlacePerSubchannel\*2-1*, and so on.  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is not provided, or is set to ‘contiguousRB’, a UE is not expected to use the last PRBs in the resource pool, except when the resource pool is a dedicated SL PRS resource pool.  **< Unchanged parts are omitted >**  8.1.2.2 Resource allocation in frequency domain  **< Unchanged parts are omitted >**  For operation with shared spectrum channel access for frequency range 1, if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’,  - the lowest index of the RB set allocation to the initial PSSCH transmission is indicated via the field "Lowest index of the RB set allocation to the initial transmission" of the DCI format 3\_0.  - the starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 is indicated via the higher layer parameter *sl-StartRBsetCG-Type1*.  **< Unchanged parts are omitted >**  8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission for a carrier. To trigger this procedure, in slot *n* for this carrier*,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:  - the resource pool from which the resources are to be reported;  - L1 priority, ;  - the remaining packet delay budget;  - number of sub-channels, : If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is not provided, the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot is . If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', corresponds to the number of sub-channels within all used RB sets to be used for the PSCCH/PSSCH transmission in a slot. If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', corresponds to the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot in each RB set,  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, LRBset.  - optionally, the number of consecutive slots for multi-consecutive slots transmission, .  **< Unchanged parts are omitted >**  8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 1-A  **< Unchanged parts are omitted >**  If *sl-MaxNumPerReserve* is3 then    where  - denotes the starting sub-channel index for the second resource  - denotes the starting sub-channel index for the third resource  - is the number of sub-channels in a resource pool, or if the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of sub-channels in each RB set, provided according to the higher layer parameter *sl-NumSubchannel*  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the applied interlace index(s) in different RB sets are the same.  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting RB set of the first resource is determined according to the clause 8.1.2.2. The number of contiguously allocated RB sets for each of the N resources LRBset≥1 and the starting RB set indexes of resources indicated by the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received, are determined from "Frequency resource assignment" which is equal to a frequency RIV (FRIV), where  If sl-MaxNumPerReserve is 2 then  **< End of text proposal >** |

## TP#2: RRC parameter alignment for TS 37.213 V18.2.0

### Proposal v1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **< Start of text proposal >** 4.5 Sidelink Channel access procedures **< Unchanged parts omitted >**  Table 4.5-1: Channel Access Priority Class (CAPC) for SL   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Channel Access Priority Class () |  |  |  |  | allowed sizes | | 1 | 2 | 3 | 7 | 2 ms | {3,7} | | 2 | 2 | 7 | 15 | 4 ms | {7,15} | | 3 | 3 | 15 | 1023 | 6ms or 10 ms | {15,31,63,127,255,511,1023} | | 4 | 7 | 15 | 1023 | 6ms or 10 ms | {15,31,63,127,255,511,1023} | | NOTE1: For , if the higher layer parameter *absenceOfAnyOtherTechnology-r18* is provided, otherwise, .  NOTE 2: When it may be increased to by inserting one or more gaps. The minimum duration of a gap shall be . The maximum duration before including any such gap shall be . | | | | | |   **< Unchanged parts omitted >** 4.5.4 Contention window adjustment procedures for SL transmissions If a UE transmits a SL transmission(s) including at least one PSSCH using Type 1 channel access procedures associated with the channel access priority class on a channel, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  1) For every priority class set .  2) If a HARQ-ACK feedback corresponding to the PSSCH(s) for unicast SL transmission(s) in the reference duration for the latest channel occupancy initiated by the UE, is available:  - If the HARQ-ACK feedback includes only 'ACK', go to step 1; otherwise go to step 5.  3) If a HARQ-ACK feedback corresponding to the PSSCH(s) for groupcast SL transmission(s) in the *reference duration* for the latest channel occupancy initiated by the UE, is available:  - If *harq-ACK-FeedbackRatioforCW-AdjustmentGC-Option2-r18* is provided by higher layers:  - The UE calculates the ratio between the number of received 'ACK' in the HARQ-ACK feedback and the number of UE(s) from which the corresponding 'ACK'/'NACK' in the HARQ-ACK feedback is expected. If the calculated ratio is equal to or larger than *harq-ACK-FeedbackRatioforCW-AdjustmentGC-Option2-r18*, go to step 1; otherwise go to step 5.  - Otherwise:  - If the HARQ-ACK feedback includes at least an 'ACK',go to step 1; otherwise go to step 5.  4) If a HARQ-ACK feedback corresponding to the PSSCH(s) in the reference duration for the latest channel occupancy initiated by the UE is not available, go to step 6.  5) Increase for every priority class to the next higher allowed value.  6) For every priority class ,maintain as it is; go to step 2.  The *reference duration* in the procedure above is defined as follows:  - The *reference duration* corresponding to a channel occupancy initiated by the UE including SL transmission(s) of PSSCH(s) is defined in this clause as a duration starting from the beginning of the channel occupancy initiated by the UE including SL transmission (s) of PSSCH(s) until the end of the first slot where at least one PSSCH with HARQ-ACK feedback(s) including 'ACK'/'NACK' is transmitted.  If a UE transmits a SL transmission(s) using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission(s) is not associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s), the UE adjusts before step 1 in the procedures described in clause 4.5.1, using the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class . If the corresponding channel access priority class has not been used for any SL transmissions on the channel, is used. For the channel, if the latest value is consecutively used for X times provided by higher layers parameter *sl-CWS-ForPsschWithoutHarqAck-r18* for generation of as described in clause 4.5.1 for PSSCH transmission(s) without associated explicit HARQ-ACK feedback(s), the is increased for every priority class to the next higher allowed value.  The following applies to the procedures described in this clause for contention window adjustment:  - If , the next higher allowed value for adjusting is .  - If the is consecutively used times for generation of , is reset to only for that priority class for which is consecutively used times for generation of . is selected by UE from the set of values {1, 2, …,8} for each priority class . 4.5.5 Energy detection threshold adaptation procedure A UE accessing a channel on which SL transmission(s) are performed, shall set the energy detection threshold () to be less than or equal to the maximum energy detection threshold .  is determined as follows:  - If the UE is configured with higher layer parameter *sl-MaxEnergyDetectionThreshold-r18*,  - is set equal to the value signalled by the higher layer parameter;  - otherwise  - the UE shall determine according to the procedure described in clause 4.5.5.1;  - if the UE is configured with higher layer parameter *sl-EnergyDetectionThresholdOffset-r18*  - is set by adjusting according to the offset value signalled by the higher layer parameter;  - otherwise  - the UE shall set .  If the higher layer parameter *absenceOfAnyOtherTechnology-r18* is not configured to a UE, the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy as described in clause 4.5.3 shall use the (pre-)configured *ue-ToUE-COT-SharingED-Threshold-r18* for accessing the channel(s).  For the case where a UE performs channel access procedures as described in clause 4.5.1 for SL transmission(s) and indicates channel occupancy sharing information, is set equal to the value provided by the higher layer parameter *ue-ToUE-COT-SharingED-Threshold-r18*. 4.5.5.1 Default maximum energy detection threshold computation procedure If the higher layer parameter *absenceOfAnyOtherTechnology-r18* is provided  - where  - is Maximum energy detection threshold defined by regulatory requirements in dBm when such requirements are defined, otherwise  otherwise  -  where  In regulatory regions and bands where it is allowed,  - = ;  - =5dB for all transmissions;  - ;  Otherwise,  - ;  - if Type 2A SL channel access procedures is performed for a SL transmission(s) that initiates a channel occupancy and includes only S-SSB as described in clause 4.5.2; otherwise ;  - or in regions and bands where regulations allow,;  - is set to the value of PCMAX\_H,*c*as defined in [3];  - ;  - is the single channel bandwidth in MHz.  The higher layer parameter *absenceOfAnyOtherTechnology-r18* is not expected to be provided if the channel(s) where UE performing SL transmission(s) is overlapped with either an LAA Scell(s) on channel(s) or channel(s) where gNB/UE performing DL/UL transmission(s).  **< End of text proposal >** |

## TP#3: RRC parameter alignment for TS 38.211 V18.2.0

### Proposal v1

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| **< Start of text proposal >**  8.3.4.2.1 Sequence generation  The sequence shall be generated according to  where is given by clause 6.3.2.2 with the following exceptions:  - is given by clause 16.3 of [5, TS 38.213];  - is given by clause 16.3 of [5, TS 38.213];  - is given by  - if the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to '*dedicatedInterlace*' and where is the resource block number within the interlace;  - otherwise  - ;  - is the index of the OFDM symbol in the slot that corresponds to the second OFDM symbol of the PSFCH transmission in the slot given by [5, TS 38.213];  - and with given by the higher-layer parameter *sl-PSFCH-HopID* if configured; otherwise, .  - with given by the higher-layer parameter *sl-PSFCH-HopID* if configured; otherwise, .  8.3.4.2.2 Mapping to physical resources  The sequence shall be multiplied with the amplitude scaling factor in order to conform to the transmit power specified in [5, TS 38.213] and mapped in sequence starting with to resource elements assigned for transmission of the second PSFCH symbol according to clause 16.3 of [5, TS 38.213] in increasing order of the index over the assigned physical resources on antenna port.  The resource elements used for the PSFCH in the OFDM symbol in the mapping operation above shall be duplicated in the immediately preceding OFDM symbol.  If the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to ‘*dedicatedInterlace*’, the mapping operation shall be repeated for each resource block in the interlace and in the RB set over the assigned physical resource blocks according to clause 16.3 of [5, TS 38.213], with the resource-block dependent sequence generated according to clause 8.3.4.2.1.  If the higher-layer parameter *sl-TransmissionStructureForPSFCH* is configured and set to ‘*dedicatedInterlace*’, the mapping operation shall be repeated for each resource block assigned for transmission of the common interlace and for PSFCH transmission with HARQ-ACK information over the assigned physical resource according to clause 16.3 of [5, TS 38.213], with the resource-block dependent sequence generated according to clause 8.3.4.2.1, where the cyclic shift on each resource block assigned for transmission of the common interlace is up to UE implementation.  **< End of text proposal >** |

## TP#4: RRC parameter alignment for TS 38.212 V18.2.0

### Proposal v1

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| **< Start of text proposal >**  7.3.1.4.1 Format 3\_0  **< Unchanged parts are omitted >**  - Lowest index of the RB set allocation to the initial transmission - bits as defined in Clause 8.1.2.2 of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  **< Unchanged parts are omitted >**  8.3.1.1 SCI format 1-A  **< Unchanged parts are omitted >**  - Frequency resource assignment - number of bits determined by the following:  - If higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured or configured to ‘contigousRB’  - bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 2; otherwise bits when the value of the higher layer parameter *sl-MaxNumPerReserve* is configured to 3, as defined in clause 8.1.5 of [6, TS 38.214].  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to ‘interlaceRB’  - X + Y bits provide the frequency domain resource allocation according to Clause x.x of [6, TS 38.214], where the X MSBs provide the RB set allocation and the Y LSBs provide the sub-channel allocation,  **< Unchanged parts are omitted >**  - bits as configured by higher layer parameter *sl-NumReservedBits,* with value set to zero, if higher layer parameter *sl-IndicationUE-B* is not configured, or if higher layer parameter *sl-IndicationUE-B* is configured to 'disabled', and if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured;  - bits if higher layer parameter *sl-IndicationUE-B* is configured to 'enabled', and if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured, with value set to zero.  - bits otherwise, with value set to zero.  - COT sharing flag – 0 or 1 bit  - 1 bit as defined in [14, TS 37.213] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured;  - 0 bit otherwise.- Conflict information receiver flag - 0 or 1 bit  - 1 bit if higher layer parameter *sl-IndicationUE-B* is configured to 'enabled', where the bit value of 0 indicates that the UE cannot be a UE to receive conflict information and the bit value of 1 indicates that the UE can be a UE to receive conflict information as defined in Clause 16.3.0 of [5, TS 38.213];  - 0 bit otherwise.  Table 8.3.1.1-1: 2nd-stage SCI formats   |  |  | | --- | --- | | Value of 2nd-stage SCI format field | 2nd-stage SCI format | | 00 | SCI format 2-A | | 01 | SCI format 2-B; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured | | 10 | SCI format 2-C; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured and the COT sharing flag field is set to '1' | | 11 | SCI format 2-D; or  reserved if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured |   **< Unchanged parts are omitted >**  8.4.1.1 SCI format 2-A  **< Unchanged parts are omitted >**  Table 8.4.1.1-1: Cast type indicator or COT sharing cast type   |  |  | | --- | --- | | **Value of Cast type indicator or COT sharing cast type** | **Cast type** | | 00 | Broadcast | | 01 | Groupcast  when HARQ-ACK information includes ACK or NACK | | 10 | Unicast | | 11 | Groupcast  when HARQ-ACK information includes only NACK; or  reserved, if higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured |   8.4.1.3 SCI format 2-C  **< Unchanged parts are omitted >**  If the 'Providing/Requesting indicator' field is set to 0, all the remaining fields are set as follows:  - Resource combinations -number of bits determined by the following:  - If higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is not configured or configured to 'contigousRB'  - bits as defined in Clause 8.1.5A of [6, TS 38.214];  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'  - bits as defined in Clause 8.1.5A of [6, TS 38.214];  **< Unchanged parts are omitted >**  - Lowest RB set indices - bits as defined in Clause 8.1.5A of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  If the 'Providing/Requesting indicator' field is set to 1, all the remaining fields are set as follows:  - Priority - 3 bits as specified in clause 5.4.3.3 of [12, TS 23.287] and clause 5.22.1.3.1 of [8, TS 38.321]. Value '000' of Priority field corresponds to priority value '1', value '001' of Priority field corresponds to priority value '2', and so on.  - Number of subchannels - bits as defined in Clause 8.1.4A of [6, TS 38.214].  - Number of RB sets - bits as defined in Clause 8.1.4A of [6, TS 38.214] if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'; 0 bit otherwise.  **< Unchanged parts are omitted >**  8.4.4 Rate Matching  **< Unchanged parts are omitted >**  - is the number of resource elements that can be used for transmission of the 2nd-stage SCI in OFDM symbol , for and for , in PSSCH transmission, where = *sl-lengthSymbols* - 2, where *sl-lengthSymbols* is the number of sidelink symbols within the slot provided by higher layers as defined in [6, TS 38.214]. is the number of symbols for SL PRS provided by the higher layer parameter *numSym-SL-PRS-2ndStageSCI* if the 2nd-stage SCI is SCI format 2-D, and = 0 otherwise. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, = *sl-NumRefSymbolLength* - 2, where *sl-NumRefSymbolLength* is provided by higher layers. If higher layer parameter *sl-PSFCH-Period* = 2 or 4, = 3 if "PSFCH overhead indication" field of SCI format 1-A indicates "1", and = 0 otherwise. If higher layer parameter *sl-PSFCH-Period* = 0, . If higher layer parameter *sl-PSFCH-Period* is 1, .  **< End of text proposal >** |

## TP#5: RRC parameter alignment for TS 38.213 V18.2.0

### Proposal v1

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| **< Start of text proposal >**  16.1 Synchronization procedures  **< Unchanged parts are omitted >**  For reception of a S-SS/PSBCH block,  - for operation without shared spectrum channel access, or for operation with shared spectrum channel access and when *sl-NumOfSSSBRepetition* is not provided and for RB-set , a UE assumes a frequency location corresponding to the subcarrier with index 66 in the S-SS/PSBCH block [4, TS 38.211], is provided by  - *sl-AbsoluteFrequencySSB*, for operation without shared spectrum channel access or when RB-set is the anchor RB-set that is the RB set that includes the S-SS/PSBCH block  - a corresponding value in *sl-AbsoluteFrequencySSB-NonAnchorList* when RB-set is a non-anchor RB-set  - for operation with shared spectrum channel access when *sl-NumOfSSSBRepetition* is provided and in RB-set , a UE assumes a frequency location corresponding to the subcarrier with index 66 in the S-SS/PSBCH block [4, TS 38.211] is provided by +, where  - is a frequency location of a lowest S-SS/PSBCH block in RB-set , where is provided by  - *sl-AbsoluteFrequencySSB* when RB-set *j* is the anchor RB-set,  - a corresponding value in *sl-AbsoluteFrequencySSB-NonAnchorList* when RB-set is a non-anchor RB-set  - is an index of an S-SS/PSBCH block from repeated S-SS/PSBCH blocks in the frequency domain and within the RB-set , where , and is provided by a value in *sl-NumOfSSSBRepetition* corresponding to RB-set ;  - is a number of resource blocks, provided by *sl-GapBetweenSSSBRepetition*, for a gap between two adjacent repeated S-SS/PSBCH blocks;  - is a number of resource blocks for a S-SS/PSBCH block transmission with SCS configuration .  **< End of text proposal >** |

## TP#6: RRC parameter alignment for TS 38.214 V18.2.0

### Proposal v1

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| **< Start of text proposal >**  7 UE procedures for transmitting and receiving on a carrier with intra-cell guard bands  For operation with shared spectrum channel access for FR1, when the UE is configured with any of *IntraCellGuardBandsPerSCS* for UL carrier and for DL carrier and *sl-IntraCellGuardBandsSL-List* for SL carrier with SCS configuration , the UE is provided with intra-cell guard bands on a carrier with , each defined by start CRB and size in number of CRBs, and , provided by higher layer parameters *startCRB* and *nrofCRBs*, respectively, where . The subscript *x* is set to DL, UL, or SL for the downlink, uplink, or sidelink, respectively. Where there is no risk of confusion, the subscript *x* can be dropped. The intra-cell guard bands separate RB sets, each defined by start and end CRB, and , respectively. The UE does not expect that *nrofCRBs* is configured with non-zero value smaller than the applicable intra-cell guard bands as specified in [8, TS 38.101-1] corresponding to and carrier size . The UE determines the start and end CRB indices for as    and    The RB set with index consists of resource blocks where . When the UE is not configured with *IntraCellGuardBandsPerSCS* for UL carrier and for DL carrier with SCS configuration , or is not configured with *sl-IntraCellGuardBandsSL-List* for SL carrier with SCS configuration , the UE determines the CRB indices for the intra-cell guard band(s), if any, and corresponding RB set(s) according to the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] corresponding to and carrier size . For any one or more of DL, UL, SL, if the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] contains no intra-cell guard bands, the number of RB sets for the carrier is .  **< Unchanged parts are omitted >**  8 Physical sidelink shared channel related procedures  **< Unchanged parts are omitted >**  In the frequency domain,  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to 'contiguousRB', a sidelink resource pool consists of *sl-NumSubchannel* contiguous sub-channels. A sub-channel consists of *sl-SubchannelSize* contiguous PRBs, where *sl-NumSubchannel* and *sl-SubchannelSize* are higher layer parameters.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', in the frequency domain, each RB set of a sidelink resource pool consists of integer number of sub-channels, where each sub-channel consists of *sl-NumInterlacePerSubchannel* interlaces having contiguous interlace indices.  For operation with shared spectrum channel access for frequency range 1, a sidelink resource pool can be (pre-)configured to include integer number of RB sets, and the lowest RB of the sidelink resource pool is aligned with the lowest RB of lowest RB set in the resource pool, and the highest RB of the sidelink resource pool is aligned with the highest RB of highest RB set in the resource pool. A UE can be configured with intra-cell guard bands according to the higher layer parameter *sl-IntraCellGuardBandsSL-List*. The configured intra-cell guard band PRBs between any two adjacent RB sets can be used only for PSSCH transmission, if and only if, the UE has successfully performed channel access procedure in both adjacent RB sets, and the UE uses both of these RB sets for PSSCH transmission. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', and if more than 1 sub-channel is used for PSSCH transmission, when the highest sub-channel of PSSCH overlaps with a single RB set and intra-cell guard band PRBs, the UE can transmit PSSCH on the PRBs belonging to the allocated sub-channel(s) except for the intra-cell guard band PRBs within the highest sub-channel.  **< Unchanged parts are omitted >**  The UE determines the set of resource blocks assigned to a sidelink resource pool as follows:  - The resource block pool consists of PRBs.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or is set to 'contiguousRB', the sub-channel *m* for consists of a set of contiguous resource blocks with the physical resource block number for , where , and *numSubchannel* are given by higher layer parameters *sl-StartRB-Subchannel*, *sl-SubchannelSize* and *sl-NumSubchannel*, respectively.  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the sub-channel *m* for consists of a set of *sl-NumInterlacePerSubchannel* contiguous interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211], *numSubchannel* is equal to the number of interlaces within one RB set divided by *sl-NumInterlacePerSubchannel*, and *sl-NumInterlacePerSubchannel* is given by higher layer parameter *sl-NumInterlacePerSubchannel*. The sub-channel *m* is indexed per RB set and is periodically indexed across multiple RB sets within the resource pool. The sub-channel with the same index is mapped to the set of *sl-NumInterlacePerSubchannel* interlace(s) with the same index(s) in different RB sets. The sub-channel#0 is mapped to interlaces 0 to *sl-NumInterlacePerSubchannel -1,* the subchannel #1 is mapped to interlaces *sl-NumInterlacePerSubchannel* to *sl-NumInterlacePerSubchannel \*2-1*, and so on.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or is set to ‘contiguousRB’, a UE is not expected to use the last PRBs in the resource pool, except when the resource pool is a dedicated SL PRS resource pool.  **< Unchanged parts are omitted >**  8.1 UE procedure for transmitting the physical sidelink shared channel  **< Unchanged parts are omitted >**  - if '*Providing/Requesting indicator*' indicates SCI format 2-C is used to convey an explicit request for inter-UE coordination information:  - the UE shall set value of the '*Priority*' field as indicated by higher layers.  - the UE shall set value of the '*Number of subchannels*' field as indicated by higher layers.  - the UE shall set value of the '*Number of RB sets*' field as indicated by higher layers if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'.  - the UE shall set value of the '*Resource reservation period*' field as indicated by higher layers.  - the UE shall set value of the '*Resource selection window location*' field as indicated by higher layers.  - the UE shall set value of the '*Resource set type*' field as indicated by higher layers if higher layer parameter *sl-DetermineResourceType* is configured to 'UE-B's request'; otherwise this field is omitted.  - if '*Providing/Requesting indicator*' indicates SCI format 2-C is used to convey inter-UE coordination information:  - the UE shall set value of the '*Resource set type*' field as indicated by higher layers.  - the UE shall set value of the '*Resource combination(s)*' field (clause 8.1.5A) as indicated by higher layers.  - the UE shall set value of the *'Lowest subchannel indices'* as indicated by higher layers  - the UE shall set value of the *'Lowest RB set indices'* as indicated by higher layers if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured to 'interlaceRB'.  - the UE shall set value of the '*First resource location*' as indicated by higher layers  - the UE shall set value of the '*Reference slot location*' as indicated by higher layers  **< Unchanged parts are omitted >**  8.1.2.1 Resource allocation in time domain  **< Unchanged parts are omitted >**  The UE shall transmit the PSSCH in consecutive symbols within the slot, subject to the following restrictions:  - The UE shall not transmit PSSCH in symbols which are not configured for sidelink. A symbol is configured for sidelink, according to higher layer parameters *sl-StartSymbol* and *sl-LengthSymbols*, where *sl-StartSymbol* is the symbol index of the first symbol of *sl-LengthSymbols* consecutive symbols configured for sidelink.  - Within the slot, PSSCH resource allocation starts at symbol *sl-StartSymbol+1,* except when *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for a SL-BWP*.* If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, there are 2 candidate starting symbols, given by *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* respectively, for PSSCH transmission for slots without PSFCH symbols; and there is one starting symbol, given by *sl-StartingSymbolFirst,* for PSSCH transmission for slots with PSFCH symbols. PSSCH resource allocation starts at the next symbol after each candidate starting symbol. In a slot, the UE may use the second candidate starting symbol, provided by *sl-StartingSymbolSecond*, only if it fails to access the channel prior to the first candidate starting symbol provided by *sl-StartingSymbolFirst.*  - The UE shall not transmit PSSCH in symbols which are configured for use by PSFCH, if PSFCH is configured in this slot.  - The UE shall not transmit PSSCH in the last symbol configured for sidelink.  - The UE shall not transmit PSSCH in the symbol immediately preceding the symbols which are configured for use by PSFCH, if PSFCH is configured in this slot.  - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission with PSSCH/PSCCH by a UE to initiate a channel occupancy for a slot, if no resource reservation is transmitted or detected for the slot and any one of the RB set(s) of the intended PSCCH/PSSCH transmission, and if UE is configured with multiple CPE starting positions provided by *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-List,* the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the PSCCH/PSSCH by the higher layer parameter *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-List*. Otherwise, the UE uses a configured default cyclic prefix extension *Text* indicated by *sl-CPE-StartingPositionsPSCCH-PSSCH-InitiateCOT-Default*.  - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission with PSSCH/PSCCH by a UE within a channel occupancy*,* the UE transmitting in the channel occupancy determines the duration of a cyclic prefix extension *Text* according to higher layer parameter *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-Default*, unless the UE is configured with multiple CPE starting positions for transmitting within a shared channel occupancy by *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-List,* in which case the UE determines the duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the PSCCH/PSSCH by the higher layer parameter *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-List,* if no resource reservation is transmitted or detected for the slot and the RB set(s) of the intended PSCCH/PSSCH transmission, otherwise, the UE uses the configured default cyclic prefix extension *Text* indicated by *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-Default.*  - For operation with shared spectrum channel access in frequency range 1, for a PSSCH/PSCCH transmission by a UE that follows another SL transmission by the same UE in a channel occupancy, the UE determines the duration of a cyclic prefix extension *Text* as follows:  - When gap between the PSSCH/PSCCH transmission and the previous SL transmission is 1 symbol, the index *i* for is set to '1'.  - When gap between the PSSCH/PSCCH transmission and the previous SL transmission is 2 symbols, the index *i* for is set to '3' for µ=1 and to '2' for µ=2.  **< Unchanged parts are omitted >**  8.1.2.2 Resource allocation in frequency domain  **< Unchanged parts are omitted >**  For operation with shared spectrum channel access for frequency range 1, if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB:  - the lowest index of the RB set allocation to the initial PSSCH transmission is indicated via the field "Lowest index of the RB set allocation to the initial transmission" of the DCI format 3\_0.  - the starting RB set index of the initial PSSCH transmission of the sidelink configured grant Type 1 is indicated via the higher layer parameter *sl-StartRBsetCG-Type1*.  **< Unchanged parts are omitted >**  8.1.3.2 Transport block size determination  For the PSSCH assigned by SCI, if Table 5.1.3.1-2 is used and *,* or a table other than Table 5.1.3.1-2 is usedand *,* the UE shall first determine the TBS as specified below:  The UE shall first determine the number of REs (*NRE*) within the slot.  - A UE first determines the number of REs allocated for PSSCH within a PRB () by , where  - is the number of subcarriers in a physical resource block,  - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for the SL-BWP, the number of sidelink symbols assumed in transport block size determination is determined by a reference number of symbols, *sl-NumRefSymbolLength*, provided by higher layers, such that *sl-NumRefSymbolLength* replaces *sl-LengthSymbols* in calculation of .  - = 3 if '*PSFCH overhead indication'* field of SCI format 1-A indicates "1", and = 0 otherwise, if higher layer parameter *sl-PSFCH-Period* is 2 or 4. If higher layer parameter *sl-PSFCH-Period* is 0, . If higher layer parameter *sl-PSFCH-Period* is 1, .  - is the number of OFDM symbols used for SL PRS in the slot as indicated by the ‘*SL PRS resource ID*’ in SCI format 2-D if the 2nd-stage SCI is SCI format 2-D, and , otherwise.,  - is the overhead given by higher layer parameter *sl-X-Overhead*,  - is given by Table 8.1.3.2-1 according to higher layer parameter *sl-PSSCH-DMRS-TimePatternList.*  Table 8.1.3.2-1: according to higher layer parameter *sl-PSSCH-DMRS-TimePatternList*   |  |  | | --- | --- | | *sl-PSSCH-DMRS-TimePatternList* |  | | {2} | 12 | | {3} | 18 | | {4} | 24 | | {2,3} | 15 | | {2,4} | 18 | | {3,4} | 21 | | {2,3,4} | 18 |   - A UE determines the total number of REs allocated for PSSCH () by , where  - *nPRB* is the total number of allocated PRBs for the PSSCH. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', a reference number of PRBs (*nref*) per interlace within 1 RB set, *sl-NumReferencePRBs-OfInterlace*, is provided by higher layers for determination of total number of PRBs for PSSCH, that is *nPRB = nref \* ninter,subCH \* nsubCH \* nRB-set,* where *ninter,subCH* is given by the higher layer parameter *sl-NumInterlacePerSubchannel, nsubCH* is the number of occupied sub-channels within one RB set for the PSSCH, and *nRB-set* is the number of occupied RB sets for the PSSCH. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB’, *nPRB =*  *\* nsubCH ,* where is provided by higher layer parameter *sl-SubchannelSize*, and *nsubCH* is the number of occupied sub-channels for the PSSCH.  - is the total number of REs occupied by the PSCCH and PSCCH DM-RS.  - is the number of coded modulation symbols generated for 2nd-stage SCI transmission (prior to duplication for the 2nd layer, if present) according to Clause 8.4.4 of [5, TS 38.212], with the assumption of .  **< Unchanged parts are omitted >**  8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2  In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission for a carrier. To trigger this procedure, in slot *n* for this carrier*,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:  - the resource pool from which the resources are to be reported;  - L1 priority, ;  - the remaining packet delay budget;  - number of sub-channels, : If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot is . If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', corresponds to the number of sub-channels within all used RB sets to be used for the PSCCH/PSSCH transmission in a slot. If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', corresponds to the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot in each RB set,  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, LRBset.  - optionally, the number of consecutive slots for Multi-consecutive slots transmission, .  **< Unchanged parts are omitted >**  The following steps are used:  1) If a number of consecutive slots is provided with a value larger than 1, the candidate multi-slot resource definition is applied. Otherwise, the candidate single-slot resource definition is applied.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', a candidate multi-slot resource is defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot , when the set of slots that are consecutive in physical slots.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', a candidate multi-slot resourceis defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot in contiguous RB sets starting from RB set z, when the set of slots that are consecutive in physical slots. A candidate single-slot resource is defined as a set of contiguous sub-channels starting from sub-channel in slot in contiguous RB sets starting from RB set z.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided or if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB’, a candidate single-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* in slot where .  The UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets included in the corresponding resource pool within the time interval correspond to one candidate single-slot resource or the UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets in consecutive slots included in the corresponding resource pool within the time interval correspond to one candidate multi-slot resource for UE performing full sensing. The UE shall assume that any set of contiguous sub-channels included in the corresponding resource pool in a set of *Y* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing periodic-based partial sensing together with contiguous partial sensing and resource (re)selection triggered by periodic transmission (), or in a set of *Y'* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (), where  - selection of is up to UE implementation under , where is defined in slots in Table 8.1.4-2 where is the SCS configuration of the SL BWP;  - if is shorter than the remaining packet delay budget (in slots) then is up to UE implementation subject to remaining packet delay budget (in slots); otherwise is set to the remaining packet delay budget (in slots).  - is selected by UE where .  - is selected by UE where . When the UE performs at least contiguous partial sensing and if , the UE selects a set of candidate slots with corresponding PBPS and/or CPS results (if available). If the number of candidate slots is smaller than , it is up to UE implementation to include other candidate slots.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'contiguousRB', the UE shall exclude candidate single-slot or candidate multi-slot resources with the sub-channel with the smallest index including resource blocks of the intra-cell guardband PRBs, configured by higher layer parameter, *sl-IntraCellGuardBandsSL-List*, or determined according to the nominal intra-cell guard band and RB set pattern as specified in [8, TS 38.101-1] when higher layer parameter, *sl-IntraCellGuardBandsSL-List*, is not configured.  **< Unchanged parts are omitted >**  8.1.4A UE procedure for determining a set of preferred or non-preferred resources for another UE's transmission  When this procedure is triggered, the following parameters are provided by the higher layer:  - the resource pool from which the preferred or non-preferred resources are to be determined;  - the resource selection window within which the preferred or non-preferred resources are to be determined;  - the resource set type (either preferred or non-preferred resource set);  - if the resource set type indicates preferred set, then the higher layer additionally provides the following parameters:  - L1 priority, ;  - the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ;  - If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of used RB sets for one PSCCH/PSSCH transmission, *LRBset*;  - the resource reservation period, , if present.  **< Unchanged parts are omitted >**  8.1.5 UE procedure for determining slots and resource blocks for PSSCH transmission associated with an SCI format 1-A  **< Unchanged parts are omitted >**  If *sl-MaxNumPerReserve* is3 then    where  - denotes the starting sub-channel index for the second resource  - denotes the starting sub-channel index for the third resource  - is the number of sub-channels in a resource pool, or if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the number of sub-channels in each RB set, provided according to the higher layer parameter *sl-NumSubchannel*  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the applied interlace index(s) in different RB sets are the same.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting RB set of the first resource is determined according to the clause 8.1.2.2. The number of contiguously allocated RB sets for each of the N resources LRBset≥1 and the starting RB set indexes of resources indicated by the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received, are determined from "Frequency resource assignment" which is equal to a frequency RIV (FRIV) where.  If sl-MaxNumPerReserve is 2 then  If sl-MaxNumPerReserve is 3 then  where  - denotes the starting RB set index for the second resource,  - denotes the starting RB set index for the third resource,  - is the number of RB sets in a resource pool,  - is the number of RB sets for each of the indicated resources,  - for FRIV indication, within the resource pool, RB sets are numbered in increasing order from 0 to from lowest frequency location to highest frequency location.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the resource is determined by an intersection of the interlaces corresponding to the indicated sub-channel(s) and the union of the indicated set of RB sets and intra-cell guard bands between the indicated RB sets, if any.  If TRIV indicates *N* < *sl-MaxNumPerReserve*,  - if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to 'interlaceRB', the starting sub-channel indexes and the starting RB set indexes corresponding to *sl-MaxNumPerReserve* minus *N* last resources are not used.  - otherwise, the starting sub-channel indexes corresponding to *sl-MaxNumPerReserve* minus *N* last resources are not used.  **< Unchanged parts are omitted >**  8.1.5A UE procedure for determining slots and resource blocks indicated by a preferred or non-preferred resource set  The set of slots and resource blocks indicated by a set of preferred or non-preferred resource(s) is determined as described below.  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to ‘contiguousRB', the set of preferred or non-preferred resources , is indicated by a reference slot and tuples , indicated by the 'resource combination' field, where for each tuple is indicated by the 9 MSBs, followed by and (if present).  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', the set of preferred or non-preferred resources , is indicated by a reference slot and tuples , indicated by the 'resource combination' field, where for each tuple is indicated by the 9 MSBs, followed by , and (if present).  The reference slot is indicated by the 'Reference slot location' field as a combination of DFN index and slot index [5, TS 38.212], with the 10 MSBs indicating the DFN index. , and if any are interpreted according to clause 8.1.5, with the following modifications:  - the value of *sl-MaxNumPerReserve* is fixed to 3.  - "slot where SCI format 1-A was received" is replaced by slot indicated as the first resource location of a .  - the first resource location of each for is indicated by a slot offset in logical slots with respect to the reference slot ; the slot offset is indicated by the 'first resource location' field; the first resource location of is at slot offset 0 with respect to the reference slot.  - "the received SCI format 1-A, except the resource in the slot where SCI format 1-A was received" is replaced by "each tuple".  - the starting sub-channel of the first resource of each tuple is separately indicated.  - if the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', the starting RB set of the first resource of each tuple is separately indicated.  The starting sub-channel of the first resource of each tuple is indicated by the 'Lowest subChannel indices' field. The starting RB set of the first resource of each tuple, if any, is indicated by the 'Lowest RB set indices' field. The resource reservation period is encoded as in SCI format 1-A.  If the set is indicated by an SCI format 2-C, the number of tuples is .  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is not provided, or it is set to ‘contiguousRB', a UE forms the union of the subsets indicated by each tuple to obtain the set .  If the higher layer parameter *sl-TransmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB', a UE forms the union of the subsets indicated by each tuple to obtain the set .  **< Unchanged parts are omitted >**  8.3 UE procedure for receiving the physical sidelink shared channel  For sidelink resource allocation mode 1, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B, 2-C and 2-D, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.  For sidelink resource allocation mode 2, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B, 2-C and 2-D, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.  A UE is required to decode neither the corresponding SCI formats 2-A, 2-B, 2-C nor the PSSCH associated with an SCI format 1-A if the SCI format 1-A indicates an MCS table that the UE does not support.  In any slot without PSFCH symbols, the UE attempts, subject to UE capability, to decode PSSCH transmission starting from the second candidate starting symbol provided by *sl-StartingSymbolSecond*, if *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided.  **< End of text proposal >** |

## TP#7: RRC parameter alignment for TS 38.215 V18.2.0

### Proposal v1

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| **< Start of text proposal >**   |  |  | | --- | --- | | **Definition** | Sidelink Received Signal Strength Indicator (SL RSSI) is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of a slot configured for PSCCH and PSSCH, starting from the 2nd OFDM symbol. If *sl-StartingSymbolFirst* and *sl-StartingSymbolSecond* are provided for a SL bandwidth part, for a slot with PSFCH symbols, SL RSSI is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of the slot configured for PSCCH and PSSCH, starting from the next OFDM symbol of the first candidate starting symbol, given by *sl-StartingSymbolFirst*, and for a slot without PSFCH symbols, SL RSSI is defined as the linear average of the total received power (in [W]) observed in the configured sub-channel in OFDM symbols of the slot configured for PSCCH and PSSCH, starting from the next OFDM symbol of the second candidate starting symbol, provided by *sl-StartingSymbolSecond*.  For frequency range 1, the reference point for the SL RSSI shall be the antenna connector of the UE. For frequency range 2, SL RSSI shall be measured based on the combined signal from antenna elements corresponding to a given receiver branch. For frequency range 1 and 2, if receiver diversity is in use by the UE, the reported SL RSSI value shall not be lower than the corresponding SL RSSI of any of the individual receiver branches. | | **Applicable for** | Sidelink |   **< End of text proposal >** |

## TP#8 for TS 38.214 V18.2.0: Issue 1-1

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| ***Reason for change:*** | In clause 8.1.2.1,   * The determination of CPE duration within a channel occupancy should be applied to all SL transmissions with PSSCH/PSCCH by the UE, other than the first SL transmission that initiates the channel occupancy. * The condition of transmitted or detected resource reservation for the slot of the intended PSSCH/PSCCH transmission should be based on “any one of the RB set(s)”. This is correctly captured for the initiating COT case, but not for the within COT case. * The current spec only describes how to determine the CPE duration for PSSCH/PSCCH transmissions, but the timing / OFDM symbol(s) in which the CPE is to be transmitted is unclear. * There is inconsistency of the description / terms used in the same spec paragraph to describe the intended PSCCH/PSSCH transmission for which the CPE is to be applied. This can lead to different interpretations of which PSSCH/PSCCH transmission(s) should be applied with CPE. * The index for CPE in some parts of the spec is correctly described as “the index *i* for 𝐶𝑖 and ” for SL-U operation, but not in other parts. |
|  |  |
| ***Summary of change:*** | In clause 8.1.2.1,   * It is corrected that the determination of CPE duration within a channel occupancy should be applied to all SL transmissions with PSSCH/PSCCH by the UE, other than the first SL transmission that initiates the channel occupancy. * It is clarified that the condition of transmitted or detected resource reservation for the slot of the intended PSSCH/PSCCH transmission should be based on “any one of the RB set(s)” for the within COT case. * It is clarified that the timing / OFDM symbol(s) in which the CPE (*Text*) to be applied for the intended PSSCH/PSCCH transmission is within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission. * It is clarified in the paragraphs that CPE transmission is applied for the “intended” PSCCH/PSSCH transmission to achieve a consistent description within the same spec. * The description of CPE index for SL-U operation is corrected as “the index *i* for 𝐶𝑖 and ” throughout the spec. |
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| ***Consequences if not approved:*** | Specification remains to be incorrect in determining the CPE starting position for PSSCH/PSCCH transmission within a channel occupancy. |

### Proposal v1

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| **< Start of text proposal >**  8.1 UE procedure for transmitting the physical sidelink shared channel  **<Unchanged part omitted>**  8.1.2.1 Resource allocation in time domain  **<Unchanged part omitted>**  - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission with PSSCH/PSCCH by a UE to initiate a channel occupancy for a slot, if no resource reservation is transmitted or detected for the slot and any one of the RB set(s) of the intended PSCCH/PSSCH transmission, and if UE is configured with multiple CPE starting positions provided by *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT,* the UE determines a duration of a cyclic prefix extension *Text* to be applied within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the intended PSCCH/PSSCH transmission by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT*. Otherwise, the UE uses a configured default cyclic prefix extension *Text* within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission indicated by *DefaultCPEStartingPositionsPSCCH-PSSCH-InitiateCOT*.  - For operation with shared spectrum channel access in frequency range 1, for an intended SL transmission with PSSCH/PSCCH by a UE within a channel occupancy, other than the first SL transmission initiating the channel occupancy*,* by default, the UE transmitting in the channel occupancy determines the duration of a cyclic prefix extension *Text* to be applied within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission only according to higher layer parameter *DefaultCPEStartingPositionsPSCCH-PSSCH-SharedCOT*, unless the UE is configured with multiple CPE starting positions for transmitting within the channel occupancy by *CPEStartingPositionsPSCCH-PSSCH-SharedCOT,* in which case the UE determines the duration of a cyclic prefix extension *Text* to be applied within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission according to [4, TS 38.211] where the index *i* for 𝐶𝑖 and [4, TS 38.211] is chosen randomly from a set of values configured per priority of the intended PSCCH/PSSCH by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-SharedCOT,* if no resource reservation is transmitted or detected for the slot and any one of the RB set(s) of the intended PSCCH/PSSCH transmission, otherwise, the UE uses the configured default cyclic prefix extension *Text* to be applied within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission indicated by *DefaultCPEStartingPositionsPSCCH-PSSCH-SharedCOT.*  - For operation with shared spectrum channel access in frequency range 1, for an intended PSSCH/PSCCH transmission by a UE that follows another SL transmission by the same UE in a channel occupancy, the UE determines the duration of a cyclic prefix extension *Text* to be applied within the first one or two symbols before the first symbol of the intended PSSCH/PSCCH transmission as follows, regardless of the duration of the cyclic prefix extension determined based on *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-Default* or *sl-CPE-StartingPositions* in *sl-CPE-StartingPositionsPSCCH-PSSCH-WithinCOT-List*, if applicable:  - When gap between the intended PSSCH/PSCCH transmission and the previous SL transmission is 1 symbol, the index *i* for 𝐶𝑖 and is set to '1'.  - When gap between the intended PSSCH/PSCCH transmission and the previous SL transmission is 2 symbols, the index *i* for 𝐶𝑖 and is set to '3' for µ=1 and to ‘2’ for µ=2.  **< End of text proposal >** |

## TP#9 for TS 38.213 V18.2.0: Issue 1-2

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| ***Reason for change:*** | Unlike PSSCH/PSCCH and PSBCH transmissions, there is only one symbol gap (the GP symbol) before PSFCH transmission. In TS 38.331, the following description is specified. Therefore, TS 38.213 should be updated accordingly.   |  | | --- | | ***sl-CPE-StartingPositionPSFCH***  Indicates CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | |
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| ***Summary of change:*** | It is corrected that the UE applies CP extension to the first symbol of a PSFCH and within the first one symbol before the first symbol of the PSFCH. |
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| ***Consequences if not approved:*** | Specification remains to be incorrect in determining the CPE starting position for PSFCH transmissions. |

### Proposal v1

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| **< Start of text proposal >** 16.3 UE procedure for reporting and obtaining control information in PSFCH Control information provided by a PSFCH transmission includes HARQ-ACK information or conflict information. 16.3.0 UE procedure for transmitting PSFCH with control information A UE can be indicated by an SCI format scheduling a PSSCH reception to transmit a PSFCH with HARQ-ACK information in response to the PSSCH reception. The UE provides HARQ-ACK information that includes ACK or NACK, or only NACK.  **<Unchanged part omitted>**  The PSFCH resources are first indexed according to an ascending order of the interlace or PRB subset index, second according to an ascending order of the RB-set index, and then according to an ascending order of the cyclic shift pair index from the cyclic shift pairs. The UE applies CP extension to the first symbol of a PSFCH and within the first one symbol before the first symbol of the PSFCH according to an index [4, TS 38.211] provided by *sl-CPE-StartingPositionPSFCH*.  A UE determines an index of a PSFCH resource for a PSFCH transmission with HARQ-ACK information in response to a PSSCH reception or with conflict information corresponding to a reserved resource as where is a physical layer source ID provided by SCI format 2-A/2-B/2-C [5, TS 38.212] scheduling the PSSCH reception, or by SCI format 2-A/2-B/2-C with corresponding SCI format 1-A reserving the resource from another UE to be provided with the conflict information. For HARQ-ACK information, is the identity of the UE receiving the PSSCH as indicated by higher layers if the UE detects a SCI format 2-A with Cast type indicator field value of "01"; otherwise, is zero. For conflict information, is zero.  **< End of text proposal >** |

## TP#10 for TS 37.213 V18.2.0: Issue 2-2

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| ***Reason for change:*** | It's ambiguous in the specification description to determine the applicable RB set(s) for COT sharing for following two reasons.   1. when *sl-MaxNumPerReserv* is configured with >1 value, the “Frequency resource assignment” field in the 1st stage SCI with COT sharing may indicates multiple reserved resources. In this case, only the RB set(s) associated with the first reserved resource is an appliable sharing RB set(s) and the RB set(s) associated with remaining reserved resources is not appliable because CO is not obtained yet. 2. "a UE initiates a channel occupancy to transmit SL transmission(s) within a RB set(s)" has ambiguous. For instance, when UE initiates CO and transmits SL transmission in RB set 0, the appliable RB sets may be incorrectly understood as RB set 0 plus RB set 1 because SL transmission within RB set 0 can also be regarded as transmission within RB set 0 plus RB set 1.   Based on above reasons, it's necessary to clarify that the appliable RB set(s) for sharing is the RB set(s) associated with the first reserved resource derived from the “Frequency resource assignment” field in the corresponding SL control information. |
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| ***Summary of change:*** | Clarify that the appliable RB set(s) for sharing is the RB set(s) associated with the first reserved resource derived from the “Frequency resource assignment” field in the corresponding SL control information |
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| ***Consequences if not approved:*** | It's ambiguous and unclear to determine the applicable RB set(s) for COT sharing. |

### Proposal v1

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| < Start of text proposal for TS 37.213 >  4.5.3 SL channel access procedures in a shared channel occupancy  When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy, i.e., the RB set(s) associated with the first resource indicated by the “Frequency resource assignment” field in the SL control information. The channel occupancy sharing information can also include additional IDs and associated cast type. The additional IDs includes one pair of Layer 1 source and destination IDs for all cast types, where the source ID is set to the source ID of the UE initiating channel occupancy for unicast and to the reserved bits for groupcast and broadcast. The channel occupancy sharing information transmitted in slot indicates the remaining channel occupancy duration in a number of physical slot(s) . If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot .  < End of text proposal for TS 37.213 > |

## TP#11 for TS 37.213 V18.2.0: Issue 2-3

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| ***Reason for change:*** | The current description of the shared channel occupancy based on the intention of sharing from a first UE () allows to share in a region described by the boundaries . The description recites “If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot ”. But if the behavior is unclear, e.g., if and then the shared region is [n+3, n+1]. |
|  |  |
| ***Summary of change:*** | Clarify that when is indicated, then it is assumed that . |
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| ***Consequences if not approved:*** | The responding UE behavior for sharing a COT is unclear when COT-SI indicates a COT remaining duration . |

### Proposal v1

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| < Start of text proposal for TS 37.213 > 4.5.3 SL channel access procedures in a shared channel occupancy When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s) including PSCCH/PSSCH(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy. The channel occupancy sharing information can also include additional IDs and associated cast type. The additional IDs includes one pair of Layer 1 source and destination IDs for all cast types, where the source ID is set to the source ID of the UE initiating channel occupancy for unicast and to the reserved bits for groupcast and broadcast. The channel occupancy sharing information transmitted in slot indicates the remaining channel occupancy duration in a number of physical slot(s) . If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). When , is not expected to be indicated. Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot .  For the case when a UE transmits SL transmission(s) in a shared channel occupancy initiated by another UE, the channel access priority class value corresponding to the SL transmission(s) is at most equal to the channel access priority class value provided by the channel access priority class in the channel occupancy sharing information.  For the case when a UE receives channel occupancy sharing information, the processing time is as defined by Table 8.1.4-1 in [8, TS 38.214], and the processing time starts from the end of the slot that carries channel occupancy sharing information.  < End of text proposal for TS 37.213 > |

## TP#12 for TS 37.213 V18.2.0: Issue 3

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| ***Reason for change:*** | In TS 37.213, there are two methods for CW adjustment. In one method (denoted by method 1), UE adjusts the contention window size based on the HARQ feedback(s) corresponding to the PSSCH within a SL reference duration. And in method 2, UE will use the latest CW of any SL transmission in the past.  However, the condition of method 1 and method 2 is not mutually exclusive in current specification. For example, PSSCH transmission with HARQ-ACK disabled can satisfy the condition of both method 1 and method 2. It will lead to an ambiguity about which method should be selected in such case. This is mainly because the condition of method 1 doesn’t restrict the HARQ feedback manner for PSSCH transmission and the condition of method 2 uses the description of SL transmission not associated with explicit HARQ-ACK feedback which also includes PSSCH transmission with HARQ-ACK disabled. |
|  |  |
| ***Summary of change:*** | Change “at least one PSSCH” to “at least one PSSCH associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s)” in the condition of method 1. |
|  |  |
| ***Consequences if not approved:*** | The spec remains ambiguous about which method of CW adjustment should be performed for PSSCH transmission with HARQ-ACK disabled, if this CR is not approved. |

### Proposal v1

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| < Start of text proposal for TS 37.213 > 4.5.4 Contention window adjustment procedures for SL transmissions If a UE transmits a SL transmission(s) including at least one PSSCH associated with explicit HARQ-ACK feedback(s) by the corresponding UE(s) using Type 1 channel access procedures associated with the channel access priority class on a channel, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  < End of text proposal for TS 37.213 > |

## TP#13 for TS 38.214 V18.2.0: Issue 4-1

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| ***Reason for change:*** | The combination of MCSt and partial sensing is supported according to the current specification. The current description “*any set of contiguous sub-channels … correspond to one candidate single-slot resource*” covers only a candidate single-slot resource case, but there is no corresponding description or definition for one candidate multi-slot resource (as it is intended by the specification). |
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| ***Summary of change:*** | Adding description for a candidate multi-slot resource in partial sensing as:  “*any set of contiguous sub-channels in consecutive slots*”. |
|  |  |
| ***Consequences if not approved:*** | The definition of a candidate multi-slot resource in partial sensing remains unclear in the specification. |

### Proposal v1

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| < Start of text proposal for TS 38.214 > 8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2 <Unchanged part omitted>  The UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets included in the corresponding resource pool within the time interval correspond to one candidate single-slot resource or the UE shall assume that any set of contiguous sub-channels or contiguous sub-channels in contiguous RB sets in consecutive slots included in the corresponding resource pool within the time interval correspond to one candidate multi-slot resource for UE performing full sensing. The UE shall assume that any set of contiguous sub-channels or any set of contiguous sub-channels in consecutive slots included in the corresponding resource pool in a set of *Y* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing periodic-based partial sensing together with contiguous partial sensing and resource (re)selection triggered by periodic transmission (), or in a set of *Y'* candidate slots within the time interval correspond to one candidate single-slot resource or one candidate multi-slot resource for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (), where  < End of text proposal for TS 38.214 > |

## TP#14 for TS 37.213 V18.2.0: Issue 5-2

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| ***Reason for change:*** | For SL transmissions including PSCCH/PSSCH, when Type 1 channel access is used for COT initiation, the CAPC value is determined based on PSCCH/PSSCH as defined in 38.300.  For SL transmissions including PSFCH only or S-SSB only, when Type 1 channel access is used for COT initiation, the CAPC value is always 0.  However, one more case is missing. At slot n, PSFCH is transmitted, and then S-SSB transmission is transmitted at slot n+1. There is no other following transmissions. Clear rule to initiate a COT for this case should be added in spec. |
|  |  |
| ***Summary of change:*** | CAPC value is 0 for this case. CAPC = 0 for PSFCH-only and S-SSB-only. Then, for both PSFCH and S-SSB, there is no reason to adopt any other value. |
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| ***Consequences if not approved:*** | CAPC value for this case is undefined and therefore UE does not determine CAPC value for this case. |

### Proposal v1

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| < Start of text proposal for TS 37.213 > 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  In this clause, transmissions from a UE are considered as separate SL transmissions, irrespective of having a gap between transmissions or not, and for sensing is adjusted as described in clause 4.5.5 when applicable.  A UE can access a channel on which SL transmission(s) are performed according to one of Type 1 or Type 2 SL channel access procedures as described in clauses 4.5.1 and 4.5.2, respectively.  When a UE applies Type 1 channel access procedures to transmit SL transmission(s), the applicable channel access priority class (CAPC) is defined in Table 4.5-1.  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including PSSCH with user plane data and associated PSCCH, the UE determines the corresponding SL channel access priority class in Table 4.5-1 following the procedures described in Clause 16.9.x.2 in [9].  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including only PSFCH transmission(s), only S-SSB transmission(s), or only PSFCH and S-SSB transmission(s), the UE shall use the channel access priority class in Table 4.5-1.  < End of text proposal for TS 37.213 > |

### Proposal v2

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| < Start of text proposal for TS 37.213 > 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  In this clause, transmissions from a UE are considered as separate SL transmissions, irrespective of having a gap between transmissions or not, and for sensing is adjusted as described in clause 4.5.5 when applicable.  A UE can access a channel on which SL transmission(s) are performed according to one of Type 1 or Type 2 SL channel access procedures as described in clauses 4.5.1 and 4.5.2, respectively.  When a UE applies Type 1 channel access procedures to transmit SL transmission(s), the applicable channel access priority class (CAPC) is defined in Table 4.5-1.  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including PSSCH with user plane data and associated PSCCH, the UE determines the corresponding SL channel access priority class in Table 4.5-1 following the procedures described in Clause 16.9.x.2 in [9].  When a UE applies Type 1 channel access procedures to transmit SL transmission(s) including only PSFCH and/or S-SSB transmission(s), the UE shall use the channel access priority class in Table 4.5-1.  < End of text proposal for TS 37.213 > |

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8. R1-2404371 Correction on the CPE starting position for SL transmissions within a COT CATT, CICTCI
9. R1-2404374 Correction on the determination of intra-cell guard band for SL-U CATT, CICTCI
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19. R1-2404647 Correction on the highest sub-channel of PSSCH in TS 38.214 ZTE, Sanechips
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24. R1-2404834 Draft CR for editorial corrections of TS 38.214 OPPO
25. R1-2404835 Draft CR on RRC alignments for Rel-18 SL operation (TS 37.213) OPPO
26. R1-2404836 Draft CR on RRC alignments for Rel-18 SL operation (TS 38.211) OPPO
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32. R1-2404845 Draft CR for correction on PSFCH power control OPPO, ZTE, Sanechips
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34. R1-2404847 Draft CR for correction on PSSCH decoding behaviour OPPO
35. R1-2404944 Correction on PSFCH power control Huawei, HiSilicon
36. R1-2404974 Draft CR on SL-U TBS determination Panasonic
37. R1-2404975 Maintenance of NR Sidelink unlicensed spectrum Panasonic
38. R1-2405025 Draft CR on CAPC value for PSFCH+S-SSB for SL-U NTT DOCOMO, INC.
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49. R1-2404949 Discussions on LS on Sidelink Feature Co-configuration Huawei, HiSilicon
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Appendix (outcomes of past meetings)

## RAN1#109-e (09 – 20 May 2022)

**Agreement**

Type 1 and Type 2 (2A/2B/2C) channel access procedures, transmission gap and LBT sensing idle time requirements specified in TS37.213 for NR-U are taken as baseline for NR sidelink operation in a shared channel.

* FFS conditions for the actual channel access type(s) used for each SL channel and signal transmitted, and based on COT sharing conditions (if supported)
* FFS whether UL CAPC or DL CAPC or both should be used as the baseline,
  + FFS how the channel access priority classes apply to each SL channel and signal
  + FFS sidelink priority levels (PQI or L1 priority), channel and signal mapping to the 4 channel access priority classes. The discussion may involve other WGs.

**Agreement**

* UE-to-UE COT sharing is supported in NR sidelink operation in a shared channel (SL-U).
  + FFS applicable SL channels and signals (e.g., PSCCH/PSSCH, PSFCH, S-SSB) for shared COT access and any restrictions (e.g. whether the COT can be shared with a single UE or multiple UEs)
  + FFS all other details in compliance with the regulatory requirements
* CP extension (CPE) is supported for NR sidelink operation in a shared channel.
  + FFS all remaining details including applicable scenarios, usage, PHY structure, etc.

**Agreement**

Channel access procedures for transmission(s) on multiple channels are supported for NR sidelink operation as defined by TS37.213 for NR-U (wherever applicable)

* FFS whether the downlink, uplink and/or semi-static multiple channel access procedure(s) (if supported) from NR-U should be used as a baseline and whether/how they are applied in SL mode 1 and mode 2 operation

**Agreement**

* The existing sidelink mode 1 RA including dynamic grant, Type 1 and Type 2 configured grants are supported as a baseline for sidelink operation in a shared carrier, subject to applicable regional regulations. At least in dynamic channel access, SL UE performs Type 1 or one of the Type 2 LBTs before SLtransmission using the allocated resource(s), in compliance with transmission gap and LBT sensing idle time requirements specified in TS37.213.
  + FFS whether/how mode 1 resource allocation ~~selection~~ procedure needs to be updated / enhanced due to shared spectrum channel access
* The existing sidelink mode 2 RA schemes are supported as a baseline for sidelink operation in a shared carrier, subject to applicable regional regulations. At least in dynamic channel access, SL UE performs Type 1 or one of the Type 2 LBTs before SL transmission using the selected and/or reserved resources, in compliance with transmission gap and LBT sensing idle time requirements specified in TS37.213.
  + FFS whether/how mode 2 resource selection procedure needs to be updated / enhanced due to shared spectrum channel access
* FFS whether/how multi-consecutive slots transmission can be supported for NR sidelink operation in unlicensed spectrum, including the following aspects
  + channel access, resource allocation and PHY channel design
* FFS whether/how enhancement is needed between the end of the LBT procedure and the start of the SL transmission to retain channel access
* RAN1 to strive for a common solution for channel access for Mode 1 and Mode 2

## RAN1#110 (22 – 26 August 2022)

**Agreement**

The following evaluation scenario can be used for evaluating performance of SL-U designs, resource allocation schemes, and coexistence study with another RAT in a shared channel.

* Scenario 1 (commercial use cases) – recommended:
  + Evaluation methodology baseline is NR-U from TR 38.889 with the following updates.
  + Indoor layout
    - Option 1: a pairs topology for SL-U from R1-2205033 – recommended



* + - * a = 20m, b = 60m, c = 20m, d = 80 m
      * There are two operators to model two RATs at a time. The red one is SL-U UE, the blue one is Wi-Fi or NR-U.
      * For NR-U / Wi-Fi, the same number of UEs / Wi-Fi STA as the total number of SL-U devices are dropped in the area. The NR-U UE / Wi-Fi nodes are dropped uniformly per gNB/AP per 20 MHz.
        + Companies should report if they used a different number of UEs / Wi-Fi STA as the total number of SL-U devices, as an additional evaluation scenario.
      * For evaluation of unicast traffic, the topology of SL-U is pair topology and the SL-U UEs are dropped uniformly at random in the area.
        + Companies should report how SL-U UEs are paired
        + 6 SL-U pairs and 4 NR-U UEs / Wi-Fi nodes per gNB/AP per 20 MHz
      * For evaluation of groupcast traffic, SL-U UEs are dropped uniformly at random in the area, SL-UEs form groupcast UE group based on TX-RX UE distancing, the distance is provided by each company.
        + Companies should report how SL-U UEs form a group
        + 12 SL-U UEs and 4 NR-U UEs / Wi-Fi nodes per gNB/AP per 20 MHz
      * For evaluation of broadcast traffic, SL-U UEs are dropped uniformly at random in the area.
        + 12 SL-U UEs and 4 NR-U UEs / Wi-Fi nodes per gNB/AP per 20 MHz
    - Option 2: SL UE clusters (R1-2203146)

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* + - * Indoor layout and UE dropping model with N = 3 or 6 clusters and each with M=5 UEs
      * Each cluster is a circle, with a central point and radius Rmax = 15 or 10m and Rmin = 5 or 1m
      * No overlapping among the N clusters
      * For coexistence, there are two operators to model two RATs at a time, where the red one is Wi-Fi AP or NR-U gNB. NR-U UE / Wi-Fi STA are dropped uniformly per gNB/AP.
      * Simulation bandwidth can be larger than 20MHz (e.g., 80MHz)
  + Channel model follows NR InH Mixed Office model used in NR-U (TR38.889)
  + Traffic model
    - Option 1: R17 sidelink commercial traffic model with periodic model 3 with packet size reduced by a factor of (high: 1; mid: 5; low: 10)
      * FFS whether/how the PDB requirement can be captured
    - Option 2: FTP model 3 with arrival rate satisfying one of the followings:
      * BO Low load: 10%~25%
      * BO Mid load: 35%~50%
      * BO High load: above 55%
    - Option 3: XR cloud gaming model in TR38.838
      * FFS whether/how the PDB requirement can be captured
    - It is up to each company to use either Option 1 or 2 or Option 3 or mixed of them
  + Interference model:
    - Layout option 1: Explicit modelling of NR-U / WiFi transmissions (as per TR38.889)
    - Note, for the interference traffic model:
      * The same or equivalent traffic model setting as SL-U should be used as much as possible to achieve equal load (e.g., SL-U RAT offered load equal the interfering RAT’s offered load).
      * The same number of traffic flows should be used between SL-U and the interfering RAT (e.g., 10 UEs with 10 flows, and 5 STAs with 2 flows each, one for DL and one for UL)
        + Companies should report if they used a different assumption, as an additional evaluation scenario.
  + Performance metric: UPT, latency, and PRR which regards the packet whose delay exceeding the remaining PDB as transmission failure.
    - FFS: UE satisfaction/system capacity as section 7.2 in TR 38.838 for XR traffic evaluation
    - FFS for groupcast and broadcast
  + Fair coexistence criterion between SL-U and the interfering RAT (e.g., according to NR-U TR38.889)

**Agreement**

* CW adjustment
  + NR-U DL CW adjustment mechanism is used as the baseline for SL-U when SL-HARQ feedback is enabled in SCI for unicast
    - FFS any necessary update for SL-U operation
  + FFS: how to determine CW size when SL-HARQ feedback is disabled in SCI
  + FFS the case of groupcast option 1 (NACK-only) and groupcast option 2

**Agreement**

* Type 2A/2B/2C SL channel access procedures
  + Type 2A channel access procedure is applicable to the following case:
    - Transmission(s) by a UE following transmission(s) by another UE for a gap ≥ 25μs in a shared channel occupancy
    - FFS any other transmission by a UE (e.g., other than COT sharing)
    - FFS whether Type 2A is used also for the case of short control signalling transmission
  + Type 2B channel access procedure is applicable to the following case:
    - Transmission(s) by a UE following transmission(s) by another UE at least when the gap is 16μs in a shared channel occupancy
    - FFS the case when the gap is between 16 and 25us
    - FFS any other transmission by a UE (e.g., other than COT sharing)
  + Type 2C channel access procedure is applicable to the following case:
    - Transmission(s) by a UE following transmission(s) by another UE for a gap ≤ 16μs in a shared channel occupancy and the duration of the corresponding transmission is at most 584us.
    - FFS any other transmission by a UE (e.g., other than COT sharing)
    - FFS whether Type 2C is used also for the case of short control signalling transmission
  + FFS under which conditions (other than the gap) UEs can apply the Type 2A/2B/2C SL channel access procedures
  + FFS under which conditions Type 2B or Type 2C is applied in case of a gap of 16 μs

**Agreement**

Multi-consecutive slots transmission (MCSt) is supported for Mode 1 and Mode 2 resource allocation in SL-U.

* FFS details

**Agreement**

* For UE-to-UE COT sharing, continue considering the following alternatives:
  + Alt. 1: A responding SL UE can utilize a COT shared by a COT initiating UE when the responding SL UE is a target receiver of the at least COT initiating UE’s PSSCH data transmission in the COT.
    - When the responding UE uses the shared COT for its transmission has an equal or smaller CAPC value than the CAPC value indicated in a shared COT information
    - FFS any additional conditions
  + Alt. 2: A responding SL UE can utilize a COT shared by a COT initiating UE when the responding SL UE is a target receiver of the COT initiating UE’s transmission in the COT.
    - When the responding UE uses the shared COT for its transmission has an equal or smaller CAPC value than the CAPC value indicated in a shared COT information
    - FFS how to determine a SL UE is a target receiver
    - FFS: details of the channel type of the COT initiating UE’s transmission
    - FFS any additional conditions
  + For Alt1 and Alt2: When a responding UE uses a shared COT for its transmission(s), the COT initiating UE is a target receiver of the responding UE’s transmission(s).
    - FFS: details of the channel type of the responding UE’s transmission(s)
* gNB relaying/forwarding a UE initiated COT to another UE is not supported in Rel-18
* FFS whether a Mode 1 UE can report a COT or related information to gNB for aiding Mode 1 RA

## RAN1#110bis-e (10 – 19 October 2022)

**Agreement**

* Type 1 SL channel access procedure is applicable to the following transmissions by a UE:
  + PSSCH/PSCCH transmission(s) scheduled or configured by a gNB in SL Mode 1 resource allocation.
  + PSSCH/PSCCH transmission(s) from the UE in SL Mode 2 resource allocation.
  + Other SL transmissions including S-SSB and PSFCH transmissions from a UE
    - FFS: how to set CAPC for S-SSB and PSFCH
  + Note: Type 1 can be used to initiate a COT
* A UE uses a channel access priority class applicable to the sidelink user plane data multiplexed in PSSCH for performing the Type 1 channel access procedures to transmit transmission(s) including PSSCH with user plane data and its associated PSCCH.
  + Note: how to set CAPC for MAC CE multiplexed in PSSCH is up to RAN2
* A UE shall not transmit on a channel for a Channel Occupancy Time that exceeds the maximum COT duration where the channel access procedures are performed based on a channel access priority class *p* associated with the UE transmissions, as given in CAPC table for SL.

**Agreement**

On the support of MCSt operation in SL-U, following options are to be further studied and one or more of the following options will be selected in future meetings.

* When L1 is triggered for reporting a subset of candidate resources for MCSt,
  + Option 1: Only one set of parameters (, remaining PDB, and ) is provided for the resource selection procedure in L1
    - Note, this is applicable for transmission of a single TB and multiple TBs
    - FFS: whether this is the same or different than Rel-16
  + Option 2: one or multiple sets of parameters (, remaining PDB, and ) are provided for the resource selection procedure in L1
  + FFS: any further information needs to be provided to L1 for MCSt
* When L1 reports a subset of candidate resources for MCSt,
  + Option A: L1 reports candidate multi-slot resources in *SA* where a candidate multi-slot resource consists of a set of single-slot resources that are consecutive in time
    - FFS whether the set of single-slot resources within a candidate multi-slot resource can have different sizes
  + Option B: L1 reports candidate single-slot resources in (*SA*) as in Rel-16
    - It is up to the higher (MAC) layer to select a set of single-slot resources that are consecutive in logical slots
  + Option C: L1 reports consecutive single-slot candidate resources in *SA*
    - FFS whether the consecutive single-slot candidate resources can have different sizes
  + FFS: any further information needs to be reported to MAC layer, provided to L1 or utilized for MCSt
  + FFS: whether/how to consider the additional LBT time in SL resource allocation

**Agreement**

For dynamic channel access mode with multi-channel case in SL-U, NR-U UL channel access procedure is considered as baseline for transmission on multiple channels

* FFS: whether transmission of PSFCH and/or S-SSB on a subset of RB sets is supported (using the NR-U DL channel access procedure as baseline)
* FFS any necessary enhancement and modification for the SL-U operation

**Agreement**

In Type 1 SL channel access procedure, the following table is adopted for channel access priority class (CAPC) for SL.

* FFS: the applicability and usage of NOTE1 in the table
* FFS: whether ***mp****=1* can be used with ***p=1***, and applicable cases

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Channel Access Priority Class (*p*) | *mp* | *CWmin,p* | *CWmax,p* | *Tslmcot,p* | allowed *CWp* sizes |
| 1 | 2 | 3 | 7 | 2 ms | {3,7} |
| 2 | 2 | 7 | 15 | 4 ms | {7,15} |
| 3 | 3 | 15 | 1023 | 6ms [or 10 ms] | {15,31,63,127,255,511,1023} |
| 4 | 7 | 15 | 1023 | 6ms [or 10 ms] | {15,31,63,127,255,511,1023} |
| [NOTE1:   For*p*=3,4, *Tslmcot*,*p*=10*ms* if the higher layer parameter absenceOfAnyOtherTechnology-r14 or absenceOfAnyOtherTechnology-r16 is provided, otherwise,*Tslmcot*,*p*=6*ms*.]  NOTE 2:   When *Tslmcot*,*p*=6*ms* it may be increased to 8*ms* by inserting one or more gaps. The minimum duration of a gap shall be 100*μs*. The maximum duration before including any such gap shall be 6*ms*. | | | | | |

**Agreement**

* RAN1 is to study the definition of a “SL reference duration” following the NR-U principle and RAN1 is to agree on the definition before down-selection to an option for CW adjustment for SL HARQ-ACK feedback enabled/disabled and each cast type
* In Type 1 SL channel access procedure, further study the following cases and options. Other options are not precluded.
  + CW adjustment when SL-HARQ feedback is disabled (at least if all transmissions within the latest SL reference duration have SL-HARQ feedback disabled):
    - Option 1: For every priority class ,use the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class .
    - Option 2: CW is adjusted according to number blind retransmissions of the TBs within a COT.
    - Option 3: CW is adjusted according to CR/CBR measurement, if CR/CBR is supported for SL-U
    - Option 4: If a is consecutively used times for generation of , is updated for each priority class to the next higher allowed value.
    - Option 5: If a collision indicator is received, increase for every priority class to the next higher allowed value.
  + CW adjustment for groupcast option 2 with SL-HARQ feedback enabled (~~i.e.~~, at least In case only groupcast option 2 PSSCH(s) is (are) transmitted within the latest SL reference duration):
    - Option 1: Based on a (pre-)configurable ratio of received SL HARQ-ACK feedbacks in the latest SL reference duration, is reset to for every priority class , otherwise increase for every priority class to the next higher allowed value.
      * FFS: whether the ratio of the received SL HARQ-ACK feedbacks is ‘ACK’, ‘NACK’ or ‘ACK+NACK’
      * FFS: how to calculate the ratio
      * FFS: the (pre-)configuration ratio values
    - Option 2: If at least a ‘ACK’ is received related to any transmissions within the latest SL reference duration, for each priority class ; otherwise is increased.
  + FFS whether groupcast option 1 (NACK-only) with SL-HARQ feedback enabled can be supported for SL-U. If supported, further study the following options (at least if all transmissions within the latest SL reference duration are groupcast option 1 transmissions)
    - Option 1: For every priority class ,use the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class .
    - Option 2:
      * If ‘NACK’ or a collision indicator (IUC scheme 2) is received related to any transmissions within the latest SL reference duration, increase for every priority class to the next higher allowed value.
      * When neither ‘NACK’ nor a collision indicator (IUC scheme 2) is received related to any transmissions within the latest SL reference duration,
        + Option A: is reset to for every priority class .
        + Option B: For every priority class ,use the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class .
    - Option 3: An ACK-only procedure is used instead of a NACK-only procedure. In this case, if at least a ‘ACK’ is received related to any transmissions within the latest SL reference duration, for each priority class , otherwise is increased
    - Option 4: CW is adjusted according to CR/CBR measurement, if CR/CBR is supported for SL-U
    - Option 5 (option 3+legacy): ACK feedback is performed when a TB is successfully decoded in addition to the legacy NACK-only procedure. In this case, if ACK only is received related to any transmissions within the latest SL reference duration then ,  otherwise is increased.
  + CW adjustment for unicast with SL-HARQ feedback enabled (at least In case only unicast PSSCH(s) is (are) transmitted within the latest SL reference duration):
    - Option 2: If at least one ‘ACK’ is received related to any transmissions within the latest SL reference duration, for each priority class ; otherwise is increased.
* FFS the case when UE is operating with different SL-HARQ feedback schemes (e.g., UE has concurrent broadcast transmission + unicast with SL-HARQ enabled, or GC option 1 + GC option 2, etc in the SL reference duration).

## RAN1#111 (14 – 18 November 2022)

**Agreement**

* Type 2A channel access procedure is applicable for S-SSB transmissions from a UE without a shared channel occupancy, when the following constraints are met:
  + Time duration is at most 1ms per transmission
  + The duty cycle of the S-SSB transmissions is at most 1/20
  + FFS: details of EDT
  + FFS: whether/how to define observation period, including whether or not observation period would be captured in the specifications if defined
* FFS: Type 2A applicability for PSFCH without a shared channel occupancy and further limitations for combined transmissions of both S-SSB and PSFCH using Type 2A channel access procedure

**Agreement**

* Performance metric, company to report which one of the following options is evaluated in their simulation results.
  + Option 1:
    - For GC and BC, a device within the range (a, b) from the TX can be a receiver, and the UPT/latency/PRR can be calculated by average. The packet whose delay exceeding the remaining PDB as transmission failure.
  + Option 2:
    - For GC, UPT and latency for a packet is measured from the perspective of the worst-case RX (i.e., the one with the longest transmission time).
    - For BC, UPT and latency for a packet are measured for each RX separately.
  + Option 3:
    - For GC and BC, UPT, latency and PRR are measured from the perspective of each RX UE

**Agreement**

* For dynamic channel access mode with multi-channel case in SL-U, use NR-U DL (Type A or Type B) multi-channel access procedure as the baseline for multiple PSFCH transmissions on multiple channels, where each PSFCH transmission is confined within one LBT channel
  + FFS: the case for S-SSB if agreed to transmit S-SSB (or S-SSB can be (pre-)configured) in more than one RB set
  + FFS: whether type A or type B or both will be supported for this case for PSFCH
  + FFS: whether multiple PSFCH transmissions on multiple channels after performing the multi-channel access procedure is limited to contiguous RB sets

**Agreement**

* SL reference duration is defined as a duration corresponding to a channel occupancy initiated by the UE including transmission of PSSCH(s), starting from the beginning of the channel occupancy initiated by the UE including transmission of PSSCH(s), until either (one option to be selected later):
  + Option 1a:
    - the end of the first slot where at least one PSSCH with ACK/NACK HARQ-ACK enabled is transmitted
    - Note, SL reference duration is not used if PSSCH with ACK/NACK HARQ-ACK enabled cannot be found in the latest COT
    - FFS: Whether to support another ending timing is FFS, e.g for MCSt if needed
  + Option 1b:
    - the end of the first slot where at least one PSSCH with HARQ-ACK enabled is transmitted
    - Note, SL reference duration is not used if PSSCH with HARQ-ACK enabled cannot be found in the latest COT
    - FFS: Whether to support another ending timing is FFS, e.g for MCSt if needed
  + Option 2a:
    - the end of the first slot where at least one PSSCH with HARQ-ACK enabled if it is transmitted, otherwise until the end of the channel occupancy
    - FFS: Whether to support another ending timing is FFS, e.g for MCSt if needed
  + Option 2b:
    - the end of the first slot where at least one PSSCH with HARQ-ACK enabled if it is transmitted, otherwise until the time when UE updates the CW
    - FFS: Whether to support another ending timing is FFS, e.g for MCSt if needed

**Agreement**

* A CPE is transmitted from a CPE starting position before SL transmission within a COT, select one or both of the two options:
  + Option 1: within the symbol just before the next AGC symbol
  + Option 2: within at most 1, 2 or 4 symbols just before the next AGC symbol for 15, 30 or 60 kHz SCS, respectively
  + FFS: whether Option 1 and Option 2 are both applicable and the conditions (e.g., Option 1 in case of COT sharing and Option 2 in case of initiating a COT)
  + FFS: which channel access type(s) is applicable for option 1 and option 2
  + FFS: other details
* A single CPE starting position for PSFCH
  + FFS CPE starting position and whether it should be (pre-)configured in each RP, pre-defined or indicated
  + FFS other details (e.g., indication granularity)
  + Note: value 0 is a candidate
* At least one CPE starting position for S-SSB
  + FFS CPE starting position should be (pre-)configured, pre-defined or indicated
  + FFS: Whether multiple CPE starting positions should be (pre-)configured, pre-defined or indicated
  + FFS CPE starting positions for the R16 S-SSB and the additional S-SSBs
  + Note: value 0 is a candidate
* One or multiple CPE starting positions can be (pre-)configured in each resource pool for PSSCH/PSCCH
  + When multiple CPE starting positions are (pre-)configured,
    - FFS whether/how to define a criteria for selecting a default CPE starting position (e.g., according to partial/full RB set allocation, resource reservation information, within or outside of a COT, etc.)
    - FFS criteria for selecting one of the multiple CPE starting positions (e.g., according to priority level (e.g., CAPC or L1), selected randomly by UE from the (pre-)configured set of CPEs, selected by the UE based on channel access result, determined based on indication from the COT initiating UE, etc.)
  + FFS other details

**Agreement**

For UE-to-UE COT sharing,

* When performing S-SSB transmission(s), a responding UE can utilize a COT shared by a COT initiating UE (using type 1 channel access) when the responding UE is intended to transmit S-SSB within RB set(s) corresponding to the shared COT.
* When performing PSFCH transmission(s), a responding UE can utilize a COT shared by a COT initiating UE at least when at least one of the responding UE’s PSFCH transmissions in a symbol/slot within RB set(s) corresponding to the shared COT is intended for the COT initiating UE.
  + FFS: whether a responding UE can transmit PSFCH(s) to UE(s) other than the initiator
* When performing PSSCH/PSCCH transmission(s), a responding UE can utilize a COT shared by a COT initiating UE at least when the responding UE’s PSSCH/PSCCH transmission(s) within RB set(s) corresponding to the shared COT is intended for the COT initiating UE
  + FFS whether to support the case if a responding UE transmits PSSCH/PSCCH to destination ID other than the source ID of the COT initiating transmission, where the destination ID of the responding UE’s PSSCH/PSCCH transmission(s) can be different from the source/destination IDs of COT initiating UE’s PSSCH/PSCCH transmission when sharing the COT information.
    - FFS: how to determine / what are the restrictions to the destination ID of the responding UE’s PSSCH/PSCCH transmission(s) to utilize the COT shared by the initiating UE.
    - FFS whether the responding UE can utilize the COT when at least the responding UE’s PSCCH transmission in the reserved resources within the shared COT or MCSt is intended for the COT initiating UE and what are the restrictions (e.g., priority, etc.) and indication to the responding UE.
* FFS: UE forwarding/relaying information about a COT initiated by another UE.

**Agreement**

* If , the next higher allowed value for adjusting is .
* If the is consecutively used times for generation of , is reset to only for that priority class for which is consecutively used times for generation of . is selected by UE from the set of values {1, 2, …,8} for each priority class .

## RAN1#112 (February 27th – March 03rd, 2023)

**Agreement**

The CAPC level that should be used for S-SSB transmissions:

* Option 1: CAPC value (p) should be set to 1 when UE performs Type 1 channel access procedure for S-SSB transmission

**Agreement**

The CAPC level that should be used for PSFCH transmission, CAPC value (p) should be set to 1 when UE performs Type 1 channel access procedure for PSFCH transmission

**Agreement**

The end timing for the definition of reference duration in the contention window adjustment procedure for SL-U is defined as follows:

* Option 1a
  + the end of the first slot where at least one PSSCH with ACK/NACK HARQ-ACK enabled is transmitted
  + Note, SL reference duration is not used if PSSCH with ACK/NACK HARQ-ACK enabled cannot be found in the latest COT
  + FFS: Whether to support another ending timing is FFS, e.g. for MCSt if needed
  + Whether/how to adjust CWS for groupcast option 1 NACK-only case and whether/how to define reference duration for groupcast option 1 NACK-only case can still be discussed

**Agreement**

A CPE can be transmitted from a CPE starting position before SL transmission for the following two options:

* Option 1: within the symbol just before the next AGC symbol
* Option 2:
  + within the symbol just before the next AGC symbol for 15 kHz SCS
  + within at most 2 symbols just before the next AGC symbol for 30 or 60 kHz SCS
* FFS applicable scenario(s), condition(s) and channel type(s) to apply Option 1 or Option 2

**Agreement**

* A responding UE over a shared COT can be:
  + a receiving UE, which is the target of a PSCCH/PSSCH transmission of a COT initiator
    - In the case of unicast from the COT initiator, within the same COT when the source and destination IDs contained in the COT initiator’s SCI match to the corresponding destination and source IDs relating to the same unicast at the receiving UE
    - In the case of groupcast and broadcast, when the destination ID contained in the COT initiator’s SCI match to a destination ID known at the receiving UE
  + a UE identified by ID(s), if additional IDs are supported in the COT sharing information (in addition to the source and destination IDs of the PSCCH/PSSCH transmission), when additional IDs are included in the COT sharing information from the COT initiator
    - FFS Limitations on what additional IDs may be included and how they may be indicated

**Agreement**

A responding UE’s SL transmission(s) within RB set(s) corresponding to a shared COT can be transmitted when the CAPC value(s) of the SL transmission(s) have an equal or smaller CAPC value than the CAPC value indicated in the COT sharing information.

**Agreement**

A responding UE’s PSSCH/PSCCH transmission(s) within RB set(s) corresponding to a shared COT is intended for the COT initiating UE when,

* In the case of unicast from the responding UE, when the source and destination IDs contained in the responding UE’s PSCCH/PSSCH match to the destination and source IDs from a COT initiator’s unicast transmission that included COT sharing information, or match to the additional ID(s) included in the COT sharing information (if supported)
* In the case of groupcast or broadcast from the responding UE, when the destination ID contained in the responding UE’s PSCCH/PSSCH matches to the destination ID from a COT initiator’s groupcast or broadcast transmission that included COT sharing information, or matches to the additional ID(s) included in the COT sharing information (if supported)
* FFS: all other details and additional restrictions

## RAN1#112bis-e (April 17th – 26th, 2023)

**Agreement**

The existing NR-U EDT procedures for uplink transmissions is taken as the baseline for SL-U in Rel-18.

* FFS: details for S-SSB and PSFCH transmissions (e.g., EDT determination based on PC,MAX and/or network configured EDT, value for TA), if needed

**Agreement**

For the CPE agreements reached so far in this agenda, the 1 or at most 2 symbols just before the next AGC symbol for CPE transmission is/are physical symbol(s).

**Agreement**

The container for carrying the COT sharing information from a COT initiator UE includes at least the SCI.

* FFS 1st and/or 2nd stage SCI

**Agreement**

For dynamic channel access mode with multi-channel case in SL-U, both NR-U DL Type A and Type B multi-channel access procedure are supported for multiple PSFCH transmissions on multiple channels.

* FFS: It is up to UE implementation to perform either Type A or Type B multi-channel access procedure.
* FFS: whether this can initiate a shared COT
* FFS: whether there is any special handling needed for transmission in a shared COT on one or more of the channels

**Agreement**

Channel access procedures for SL multi-channel transmission(s) include the following cases.

* If a UE is scheduled to transmit on a set of channels *C*, and if the SL transmissions are scheduled to start transmissions at the same time on all channels in the set of channels *C*, or
* If a UE intends to perform sidelink transmissions on configured resources on the set of channels *C*, and if the SL transmissions are configured to start transmissions at the same time on all channels in the set of channels *C*, or
* If a UE intends to perform sidelink transmissions on selected resources on the set of channel *C*, and if SL transmissions are to start at the same time on all channels in the set of channels *C*.

**Agreement**

The ACK/NACK HARQ-ACK feedback corresponding to the PSSCH for SL unicast in the reference duration for the latest SL channel occupancy for which ACK/NACK HARQ-ACK feedback is available is used as follows:

* If ‘ACK’ is received, for every priority class , ; otherwise is increased to the next allowed value.
* Note: this is not applied to the case that reference duration includes multiple PSSCHs with ACK/NACK HARQ-ACK enabled, if that case is supported.

**Agreement**

The ACK/NACK HARQ-ACK feedback corresponding to the PSSCH for SL groupcast option 2 in the reference duration for the latest SL channel occupancy for which ACK/NACK HARQ-ACK feedback is available is used according to Option 2 when the ratio in Option 1 is not (pre-)configured; otherwise Option 1.

* Option 1: Based on a (pre-)configurable ratio of received SL HARQ-ACK feedbacks in the latest SL reference duration, is reset to for every priority class , otherwise increase for every priority class to the next higher allowed value.
  + FFS: whether the ratio of the received SL HARQ-ACK feedbacks is ‘ACK’, ‘NACK’ or ‘ACK+NACK’
  + FFS: how to calculate the ratio
  + Note: the (pre-)configuration ratio values of 100% is a valid candidate
* Option 2: If at least a ‘ACK’ is received related to any transmissions within the latest SL reference duration, for every priority class ; otherwise is increased.

**Working assumption**

When multiple CPE starting candidate positions are (pre-)configured for PSCCH/PSSCH transmission, for the case of initiating a COT

* For partial RB set resource allocation, the UE selects a CPE starting position according to one of the followings (to be down-selected) according also to reservation information
  + A (pre-)configured default CPE starting position
  + The highest priority among the detected and the transmitted reservations
  + Note: the exact condition and how to use reservation information needs to be decided
  + FFS whether the behavior should be allowed for full RB set resource allocation
  + FFS other condition including comparison of EDT and the measured energy associated the existing reservation
  + FFS whether the use of reservation information is conditioned on the existence of other technologies (e.g., NR-U)
* For the case of full RB set resource allocation, a CPE starting position is randomly selected among the one or multiple CPE starting candidate positions (pre-)configured per priority of the PSCCH/PSSCH transmission.
  + FFS whether the behaviour should be allowed for partial RB set resource allocation
  + Note: the exact condition and whether/how to use reservation information needs to be decided
  + FFS whether the UE uses only the selected CPE starting position or a later CPE starting position(s) than the selected one (e.g., if failed or not finished) could be also used.
  + FFS whether the use of reservation information is conditioned on the existence of other technologies (e.g., NR-U)
* FFS whether this applies only to mode 2 or including mode 1 as well

**Agreement**

For 15 kHz, 30kHz and 60kHz SCSs, a set of CPE starting candidate position(s) for PSCCH/PSSCH is (pre-)configured or pre-defined in the spec (to be down-selected) separately for transmission within COT and transmission outside COT.

* Note: It is up to the (pre-)configuration or pre-definition in the spec (to be down-selected) whether each set of CPE starting candidate position(s) associated with Option 1 (1-symbol length) for CPE window or Option 2 (2-symbol length) for CPE window and whether each set of CPE starting candidate position(s) include one or multiple starting position(s)
* FFS whether the set(s) of CPE starting positions are (pre-)configured/pre-defined per priority
* FFS values for the (pre-)configured/pre-defined CPE starting candidate position(s) (including a default value) for each set, and whether the default value is the same or different for different sets

**Agreement**

At least the following information should be used as part of COT sharing information from the COT initiator UE.

* + CAPC used for initiating the COT
  + Existing / legacy R16/17 L1 source and destination IDs
    - FFS additional ID(s)
  + Time domain information of the shared COT
    - FFS: starting offset, number of slots, [remaining or total] COT duration, or a combination of them
  + Frequency domain information of the shared COT
    - FFS applicable RB set(s), FRIV, and any other(s)
  + FFS: how each of the above is indicated.
  + Note, other information is not precluded.

**Agreement**

Send an LS to RAN2 according to the following content for the LS:

|  |
| --- |
| RAN1 has discussed the following approaches to implement/achieve MCSt for SL-U communication. RAN1 would like to seek RAN2’s opinion on the following questions.  Approach 1: “best effort for multiple TBs”   * Step 1: Higher layer triggers L1 resource selection for one TB with one set of parameters (, remaining PDB, and ) - R16/17 behavior. * Step 2: L1 report a set of candidate single-slot resource (*SA*) according to existing L1 resource allocation procedure - R16/17 behavior. * Step 3: Higher layer selects a set of resources either randomly (R16/17 behavior) or according to a consecutive-slots criterion (new behavior) to achieve MCSt. * Step 4: Repeat Step 1-3 for different TB if required.   Approach 2: “guarantee MCSt for single TB and best effort for multiple TBs”   * Step 1: Higher layer triggers L1 resource selection for one TB with one set of parameters (, remaining PDB, and ) + “number of slots for MCSt” which could be derived based on CAPC of the logical channel/TB or other means. * Step 2: L1 report a set of candidate multi-slot resource (*SA*) according to most of the existing L1 resource allocation procedure (FFS: RSRP calculation / threshold may need to change) * Step 3: Higher layer selects a candidate multi-slot resource either randomly (R16/17 behavior) or according to a consecutive-slots criterion (new behavior). * Step 4: Repeat Step 1-3 for different TB if required.   Approach 3: “guarantee MCSt for multiple TBs”   * Step 1: Higher layer triggers L1 resource (re-)selection one time for one or multiple TBs with one set of parameters (, remaining PDB, and ) + “number of slots for MCSt” which could be derived based on CAPC of the multiple TBs. * Step 2: L1 report a set of candidate multi-slot resource (*SA*) according to most of the existing L1 resource allocation procedure (FFS: RSRP calculation / threshold may need to change) * Step 3: Higher layer selects transmission resource for the one or multiple TB(s) from the reported set of candidate multi-slot resource (*SA*).   **Question 1 (for Approach 1/ Approach 2):** feasibility of selecting the resource for a single TB in MAC layer (single-slot under Approach 1, multi-slot under Approach 2) with the principle of “concatenating” across separate resource selection triggers (across TBs)  **Question 2 (for Approach 3):** feasibility of triggering the resource selection procedures for multiple SL processes at the same time  **Question 3 (Approach 2/ Approach 3):** feasibility of providing a new parameter “number of slots for MCSt” to L1 when triggering resource (re-)selection for MCSt |

**Action to RAN2: RAN1 respectfully asks RAN2 to provide an answer to the questions above.**

**Agreement**

Final LS to RAN2 in [R1-2304257](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_112b-e/Inbox/R1-2304257.zip).

**Agreement**

To resolve the Type 1 LBT blocking issue, where one UE performing a Type 1 LBT procedure for using its own selected/reserved resource(s) is blocked by another UE’s SL transmission at least in a slot preceding to the selected/reserved resource and causing the LBT to fail, further study the following options in a future meeting.

* Option 1:
  + UE avoid selection of N consecutive resource(s) before a reserved resource with high priority when the transmitting symbols of the selected resource overlap with Type 1 LBT of the reserved resource.
  + UE avoid selection of N consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.
  + FFS: the avoidance should be performed by L1 exclusion or L2 MAC selection
  + FFS: whether / how to achieve this in RA mode 1
  + FFS: How to determine value of N
* Option 2:
  + UE prioritizes/selects resource(s) for transmission in slot(s) after a reserved resource when transmission of the selected resource is able to share the initiated COT of the reserved resource (i.e., the selected resource(s) is within the COT duration of the reserved resource and the CAPC value of the selected resource(s) is equal to or higher than that of the reserved resource).
  + UE prioritizes/selects resource(s) for transmission in slot(s) before a reserved resource when transmission of the selected resource is able to share its initiated COT with the reserved resource (i.e., the reserved resource is within the COT duration of the selected resource(s) and the CAPC value of the selected resource(s) is equal to or smaller than that of the reserved resource).
  + FFS whether / how to achieve this in RA mode 1.
* Option 3: UE selects extra / more resources than required for transmitting a TB (i.e., overbooking) to accommodate potential Type 1 LBT failures. FFS how to determine/preconfigure the number of extra selected resources.
* Option 4: The expected LBT duration is determined firstly, then resource selection takes into account of the expected LBT duration is performed.
* Option 5: At MAC layer, selection of resource(s) among the reported set of candidate resources from L1 is up to UE implementation in mode 2 for SL-U, instead of random selection.
* Option 6: UE excludes frequency resources (if any) previously reserved via SCI by other SL UEs in the corresponding slot, when estimating the detected power within a sensing slot duration in Type 1 channel access.
* Option 7: SL UE deems channel busy only if the UE detects transmission other than SL transmission occupying the channel (e.g., exceeding the energy detection threshold), i.e., the energy detection for EDT checking in LBT procedure does not take into account the energy from SL transmissions.
* Option X: No solution is needed. To avoid inter-UE blocking from performing Type 1 LBT can be handled based on UE implementation (e.g., as the start timing to perform LBT sensing is determined by each UE).

**Agreement**

A higher layer parameter “*absenceOfAnyOtherTechnology*” is supported in Rel-18 for SL transmissions in unlicensed bands (e.g., by level of regulation).

* This is per carrier (pre-)configuration
* This parameter “*absenceOfAnyOtherTechnology*” is not expected to be provided if the SL-U carrier is overlapped with either the LTE-LAA or the NR-U carrier.

**Conclusion**

For defining the locations of CPE starting positions, RAN1 concludes that the NR-U principle for switching gaps is reused in SL-U, that is:

* The TX/RX switching gap is already included in the existing channel sensing structures
* The RX/TX switching gap is already included in the existing channel sensing structures

## RAN1#113 (May 22th – 26th, 2023)

**Agreement**

* A set of all candidate CPE starting positions for SL transmission in FR1 unlicensed spectrum is pre-defined in TS38.211 as followed.
  + For 15kHz SCS, the set contains values {, , , , , , }
  + For 30kHz SCS, the set of values for CPE window of one-symbol length is {, , }
  + For 30kHz SCS, the set of values for CPE window of two-symbol length is {, , , , , , }
  + For 60kHz SCS, the set of values for CPE window of one-symbol length is {, }
  + For 60kHz SCS, the set of values for CPE window of two-symbol length is {, , }
  + is the starting position of the next AGC symbol
    - Note: when the CPE starting position is , it means that the CPE length is 0
  + is the starting position of the first symbol just before the next AGC symbol
  + is the starting position of the second symbol just before the next AGC symbol

**Agreement**

When UE performs Type 1 channel access to initiate a COT for PSCCH/PSSCH transmission:

* Scheme 1: The UE selects the (pre-)configured default CPE starting position.
* Scheme 2: A CPE starting position is randomly selected among one or multiple CPE starting candidate positions (pre-)configured per priority of the PSCCH/PSSCH transmission
  + The mapping one or multiple CPE starting positions per priority can be up to (pre-)configuration.
  + FFS: whether the priority should be the L1 priority or CAPC (to be down-selected in RAN1#114)
* For partial and full RB set resource allocations
  + If a resource reservation is transmitted or resource reservations is detected for the slot and the RB set(s) of the intended PSCCH/PSSCH transmission, Scheme 1 is applied; otherwise, Scheme 2 is applied
  + FFS: other conditions to determine whether to use scheme 1 or scheme 2
  + FFS: further enhancements for the full RB set case

**Agreement**

A set of one or more candidate CPE starting position(s) that can be used for PSCCH/PSSCH transmission within a COT (for the case of sharing a COT) and outside a COT (for the case of initiating a COT) is separately (pre-)configured per resource pool based on the pre-defined set of all candidate CPE starting positions.

* Note: for the case of sharing a COT, the CPE occurs after LBT gap for type 2A/2B/2C
* FFS whether a subset of candidate CPE starting position(s) that can be used for PSCCH/PSSCH transmission within a COT is indicated by SCI carrying COT sharing information
* FFS whether default starting position is included in each set

**Agreement**

For the time-domain information to be included as part of COT sharing information, at least the following is included:

* Remaining COT duration
  + FFS it is an absolute time length in ms or in number of slots, and payload size
* FFS: how to determine the shared slots and the starting time of the shared slots, e.g. if some slots are only intended for the COT-initiating UE and not to be shared with other UEs

**Agreement**

A sidelink transmission burst is defined as a set of SL transmissions from a UE without any gaps greater than 16μs. Transmissions from a UE separated by a gap of more than 16μs are considered as separate sidelink transmission bursts. A UE can transmit SL transmission(s) after a gap of up to 16µs within a sidelink transmission burst without sensing the corresponding channel(s) for availability.

**Agreement**

Specification supports that CPE can be transmitted between any two consecutive SL transmissions by the same UE to reduce the gap between the two transmissions so that it does not exceed .

* Note: for this case, the CPE length should not be longer than up to symbols, as per previous agreements
* FFS: details if needed (e.g., considering outcome of discussion on PSFCH-like signal in PHY agenda)
* FFS whether PSSCH can be transmitted instead of or in addition to CPE
* FFS: how to determine the CPE starting position

**Working assumption**

For UE-to-UE COT sharing in SL-U, a parameter “*ue-toUE-COT-SharingED-Threshold*” is configured to be used in the energy detection threshold adaptation procedure (similar to *ul-toDL-COT-SharingED-Threshold-r16* used for UL-to-DL COT sharing in NR-U)

* FFS candidate value(s) (need to take into consideration of different UE power class) and the granularity for the configuration

**Agreement**

When UE performs Type 2 channel access to start transmitting within a shared COT (to be further studied and down-selected in RAN1#114):

* Alt. 1: Use the method for using CPE for the case when UE performs Type 1 channel access to initiate a COT for PSCCH/PSSCH transmission
* Alt. 2: Use only the (pre-)configured default CPE starting position
* Alt. 3: use CPE to make the gap smaller or equal 16us
* Alt. 4: others

**Agreement**

For the (pre-)configurable ratio of received SL HARQ-ACK feedbacks in determining the value for the case of ACK/NACK HARQ-ACK feedback corresponding to the PSSCH for SL groupcast option 2 in the reference duration for the latest SL channel occupancy for which ACK/NACK HARQ-ACK feedback is available, the ratio is calculated by M/P, where M is the number of received ‘ACK’ feedbacks and P is the number of expected HARQ-ACK feedback to be received (equal to the number of members in a group -1).

* When the calculated ratio is equal to or above the (pre-)configured ratio, is reset to for every priority class , otherwise increase for every priority class to the next higher allowed value.

**Agreement**

If UE performs SL transmission using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission is not associated with explicit HARQ-ACK feedback by the corresponding UE(s), the following is adopted for the CW adjustment.

* For every priority class ,use the latest used for any SL transmissions on the channel using Type 1 channel access procedures associated with the channel access priority class .
* If the same value is consecutively used for X times for generation of , is updated for every priority class to the next higher allowed value.
  + FFS: whether this only applies to a resource pool without PSFCH configuration
  + FFS: value of X

**Working assumption**

The required UE processing time for decoding COT-SI is the same as SCI decoding, which is as defined by Table 8.1.4-1 in TS38.214.

* The UE processing time starts from the end of slot of the SCI that carries the COT sharing information in a slot

**Working assumption**

For the case where a COT initiating UE uses Type 1 channel access procedure to initiate a SL transmission,

* it is supported that the COT initiating UE can transmit transmission(s) within the same channel occupancy that follows a COT responding UE’s SL transmission(s) according to the channel access procedures.
  + FFS details of the SL transmission(s) from responding UE
  + FFS whether the above should be based on NR-U DL-UL-UL (Clause 4.2.1.0.3 of TS37.213) or DL-UL-DL (Clause 4.1.3 of TS37.213) COT sharing principle and its corresponding transmission gap requirements
  + FFS any other condition and restriction

**Agreement**

If a responding UE shares a channel occupancy initiated by a COT initiating UE using Type 1 SL channel access procedure on a channel, the responding UE may transmit a SL transmission that follows a SL transmission by the COT initiating UE after a gap as follows:

* If the gap is at least 25μs, the responding UE can transmit the SL transmission on the shared channel after performing Type 2A SL channel access procedures.
* If the gap is equal to 16μs, the responding UE can transmit the SL transmission on the shared channel after performing Type 2B SL channel access procedures.
* If the gap is up to 16μs and the transmission is limited to 584μs, the responding UE can transmit the SL transmission on the channel after performing Type 2C SL channel access.

**Working assumption**

For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability

* Option 2: If transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation [with high L1 SL priority], UE may prioritize/select resource(s) in the slot(s) for transmission.
  + FFS: details of applying this prioritization, which layer to perform above prioritization behaviour, and if the reserved resource belongs to a MCSt, the COT initiating UE should be able to share the COT to cover the whole MCSt
  + (pre)configuring enabling/disabling option 2 is supported
* Option 1:
  + UE may avoid selection of N consecutive resource(s) before a reserved resource with high L1 SL priority.
    - The value of N can be selected from {0, 1, 2}
    - The selection of the value of N is up to UE implementation
      * FFS: unless (pre-)configured or indicated by UE reserved resource in SCI
  + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.
    - M is determined based on UE implementation (at least including 0)
  + FFS: Which layer to perform above behaviour
  + FFS: any restriction of M
  + (pre)configuring enabling/disabling option 1 is supported
* FFS: Whether the above high priority is determined according to a (pre)configured threshold
* Note: both option1 and option2 are optional UE features

## RAN1#114 (August 21st – 25th, 2023)

**Working assumption**

When UE performs Type 2 channel access to transmit PSCCH/PSSCH within a COT:

* By default, only one value is (pre-)configured for the set of CPE starting position for inside COT
  + The value is the default CPE starting position
  + UE only use the (pre-)configured default CPE starting position
* When more than one values are (pre-)configured for the set of CPE starting position for inside COT
  + One of these values is the default CPE starting position
  + UE use the same method for using CPE for the case when UE performs Type 1 channel access to initiate a COT for PSCCH/PSSCH transmission
* FFS: whether to support that CPE can be transmitted between any two consecutive SL transmissions between COT initiator and responder, to reduce the gap between two transmissions so that it does not exceed 16us, the CPE is selected from the CPE(s) (pre-)configured for PSCCH/PSSCH within a COT

**Agreement**

A single CPE starting position for PSFCH transmission is (pre-)configured per resource pool and the value is from the set of all candidate CPE starting position defined in TS38.211.

**Agreement**

A single CPE starting position for S-SSB transmission is (pre-)configured for the SL BWP and the value is from the set of all candidate CPE starting position defined in TS38.211.

**Agreement**

“CAPC level of the initiated channel occupancy”, the payload size is 2 bits and it is carried in the 2nd stage SCI.

**Agreement**

The applicable RB set(s) for COT sharing is derived based on the “Frequency resource assignment” field in the 1st stage SCI corresponding to PSSCH with COT sharing.

**Working assumption**

An “Additional ID(s)” field is supported for unicast, groupcast and broadcast, and it is carried in the 2nd stage SCI.

* One pair of L1 source and destination IDs of 24 bits for all cast types + 2 bits for the cast type
  + At least for unicast, the source ID is set to the source ID of the COT initiator corresponding to the intended destination

**Agreement**

For the case where a COT initiating UE uses Type 1 channel access procedure to initiate a SL transmission, in order to support the COT initiating UE to resume its transmission(s) within the same channel occupancy after a COT responding UE’s transmission,

* If the COT initiator UE determines the TX gap between responding UE’s SL transmission and the initiator UE’s resumed transmission,
  + The COT initiating UE performs Type 2A, or Type 2B, or Type 2C SL channel access procedures if the gap is at least 25μs, or equal to 16μs, or up to 16μs, respectively.
* Otherwise, the COT initiating UE performs Type 2A SL channel access procedures to resume its SL transmission.

**Agreement**

A UE using a Type 1 channel access procedure to initiate a channel occupancy for SL transmission can resume its transmission(s) within the same channel occupancy, after the COT initiating UE has stopped transmitting, by performing a Type 2A SL channel access procedures, if the channel sensed by the UE is continuously idle.

**Agreement**

“Remaining COT duration” is expressed in physical slots and it is carried in the 2nd stage SCI. The payload size is 4 bits in 15kHz, 5 bits in 30kHz and 6 bits in 60kHz

* If the indicated remaining COT duration is 0 slot, then the COT is not shared by the initiator UE.
* The starting slot for the remaining COT duration is the slot in which the COT-SI is transmitted.
  + Note, when the COT-SI is transmitted in slot n, and if the remaining COT duration is set to K, then the end of the COT duration to share is slot n+K.

Note: “Remaining COT duration” cannot be such that the COT exceeds the maximum COT duration.

**Working assumption**

When UE performs Type 1 channel access for a MCSt carrying multiple TBs, the CAPC value to be used in Type 1 channel access is the highest CAPC value (lowest CAPC level) associated with the multiple TBs.

**Agreement**

When Type 2A channel access procedures is used for transmitting S-SSB outside a shared COT, for the EDT:

* =5dB for transmission including S-SSB.

**Agreement**

For SL-U UE operates in Mode 1 resource allocation, when UE uses PSSCH resource(s) provided by a DCI format 3\_X or, for a configured grant for single TB,

* The UE generates a NACK when, due to LBT failure, the UE does not transmit a PSSCH in any of the resources provided by a DCI format 3\_X or, for a configured grant, in any of the resources provided in a single period and for which the UE is provided a PUCCH resource to report HARQ-ACK information. The priority value of the NACK is same as the priority value of the PSSCH that was not transmitted due to LBT failure.
* FFS: whether/how to support multiple TBs for a DCI format 3\_X or a configured grant.

**Working assumption**

In Mode 2 resource allocation:

* Alt. 1: (rectangular shaped)
  + For contiguous RB based
    - A candidate multi-slots resource is defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot .
  + For interlaced RB based
    - A candidate multi-slots resource is defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot in contiguous RB sets starting from RB set z.
    - A candidate single-slot resource is defined as a set of contiguous sub-channels starting from sub-channel in slot in contiguous RB sets starting from RB set z.
* Note, different candidate multi-slot resources can overlap in time.

**Agreement**

In Option 2, the behaviour of UE prioritization / selection of transmission resources in slot(s) before a reserved resource that is able to share UE’s initiated COT is performed at the higher layer (MAC layer).

* Note: it is up to UE implementation how the physical layer report detected reserved resources to MAC layer

**Working assumption**

In Option 1, the following UE behaviours are performed at the higher layer (MAC layer).

* UE may avoid selection of N consecutive resource(s) before a reserved resource with high L1 SL priority.
* UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.
* Note: it is up to UE implementation how the physical layer report detected reserved resources to MAC layer

**Agreement**

In Mode 2 resource allocation,

* The higher layer can indicate a “number of consecutive slots for MCSt” () larger than 1 for L1 reporting multi-slots candidates to the higher layer. The candidate multi-slots resource definition is applied.
  + Otherwise, the candidate single-slot resource definition is applied (same as R16/17).
* The higher layer selects resources from the reported according to one of the following based on UE implementation:
  + Random selection as per R16/17
  + Higher layer is not restricted to select resources at random, and can select in consecutive slots
    - It is up to RAN2 to define detailed behaviour as needed
  + It is RAN1 intention that, once the higher layer selects a multi-slots candidate from the set , it will use all the single-slot resources of the selected multi-slots candidate for transmission. This RAN1 agreement has no intention on potential RAN2 discussion about how SL resource selection processes are defined in MCSt.
* Note, the above is intended to support Approach 1 and 2 only.
* Send an LS to RAN2 informing that it is up to RAN2 to decide in regards to the HARQ RTT timing (minimum time gap)
  + whether a single TB transmitted over consecutive slots is supported in a resource pool configured with PSFCH resource

**Agreement**

When UE performs Type 1 channel access to initiate a COT for PSCCH/PSSCH transmission, in the agreed Scheme 2 from RAN1#113, a CPE starting position is randomly selected among one or multiple CPE starting candidate positions (pre-)configured per priority of the PSCCH/PSSCH transmission. The priority level is based on the L1 priority.

**Agreement**

For the additional ID, where one pair of L1 source and destination IDs of 24 bits for all cast types:

* For groupcast and broadcast, only L1 destination ID is provided, and source ID bits are reserved.

## RAN1#114bis (October 09th – 13th, 2023)

**Agreement**

RAN1 to provide the following response to RAN2’s questions in the received LS (R1-2308832/R2-2309157)

* *RAN1 response: SL-U RB set is indexed in the same manner as defined for NR-U in clause 7 of TS 38.214 for the purpose of C-LBT failure report, and the RB set index is unique within a SL BWP.*

**Agreement**

Update the following WA made in RAN1#113:

|  |
| --- |
| **Working assumption (RAN1#113)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation [when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource] ~~[with high L1 SL priority]~~, UE may prioritize/select resource(s) in the slot(s) for transmission.   + FFS: details of applying this prioritization, which layer to perform above prioritization behaviour, and if the reserved resource belongs to a MCSt, the COT initiating UE should be able to share the COT to cover the whole MCSt   + (pre)configuring enabling/disabling option 2 is supported * Option 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation       * FFS: unless (pre-)configured or indicated by UE reserved resource in SCI   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - M is determined based on UE implementation (at least including 0)   + FFS: Which layer to perform above behaviour   + FFS: any restriction of M   + (pre)configuring enabling/disabling option 1 is supported * FFS: Whether the above high priority is determined according to a (pre)configured threshold * Note: both option1 and option2 are optional UE features |

**Agreement**

TP#5 in section 4.5 is endorsed for TS38.214 clause 8.1.4.

**Agreement**

Endorse the higher layer parameters below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| CPEStartingPositionsPSCCH-PSSCH-InitiateCOT | A set of selected indices that correspond to multiple candidate CPE starting positions to be used for PSCCH/PSSCH transmission when UE initiating a COT. The set of selected indices can be a full set or a subset of the indices of all candidate CPE starting positions specified in Table 5.3.1-3 [16, TS38.211], according to the SCS of the SL BWP. One or multiple of the selected indices is associated per L1 priority of PSSCH. One of the selected indices or a different candidate CPE starting position index is assigned as the default CPE starting position.  \* Note, it is up to RAN2 to decide on whether the same RRC parameter or a separate RRC parameter should be introduced for assigning the default CPE starting position for the case of UE initiating a COT for PSCCH/PSSCH transmission. | SEQUENCE (SIZE (1..N)) OF integer 1 to X | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionsPSCCH-PSSCH-WithinCOT | A set of one or multiple selected indices that correspond to one or multiple candidate CPE starting positions to be used by UE for PSCCH/PSSCH transmission within a COT. By default, only one index (which is the default CPE starting position) is selected from the set of all candidate CPE starting positions specified in Table 5.3.1-3 [16, TS38.211], according to the SCS of the SL BWP. When multiple indices are selected, one or multiple of the selected indices is associated per L1 priority of PSSCH. One of the selected indices or a different candidate CPE starting position index is assigned as the default CPE starting position.  \* Note, it is up to RAN2 to decide on whether the same RRC parameter or a separate RRC parameter should be introduced for assigning the default CPE starting position for the case of PSCCH/PSSCH transmission within a COT. | SEQUENCE (SIZE (1..N)) OF integer 1 to X | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionPSFCH | A CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | INTEGER (1..X) | N/A | Per resource pool | UE-specific or Cell-specific |
| CPEStartingPositionS-SSB | A CPE starting position within the GP symbol before S-SSB transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | INTEGER (1..X) | N/A | Per SL BWP | UE-specific or Cell-specific |

**Agreement**

Endorse the higher layer parameters below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| type1-LBT-Blocking-Option2 | When enabled, if UE’s transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation [when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource], UE may prioritize/select resource(s) in the slot(s) for transmission. | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |
| type1-LBT-Blocking-Option1 | When enabled, UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource. UE may also avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource. The selection of the value N is up to UE implementation from {0, 1, 2}. M is determined based on UE implementation (at least including 0). | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |

**Agreement**

Remove the square brackets in the following TP for TS 37.213.

|  |
| --- |
| 4.5.4 Contention window adjustment procedures for SL transmissions  If a UE transmits a SL transmission(s) including PSSCH(s) using Type 1 channel access procedures associated with the channel access priority class on a channel and the SL transmission(s) is enabled with explicit HARQ-ACK feedback including ‘ACK’/‘NACK’, the UE maintains the contention window value and adjusts before step 1 of the procedure described in clause 4.5.1 for the SL transmission(s) applying the following procedures:  1) For every priority class set .  2) If a HARQ-ACK feedback corresponding to the PSSCH(s) for unicast SL transmission(s) in the reference duration for the latest channel occupancy initiated by the UE, is available:  - If the HARQ-ACK feedback includes only ‘ACK’, go to step 1; otherwise go to step 4.  3) If a HARQ-ACK feedback corresponding to the PSSCH(s) for groupcast SL transmission(s) in the *reference duration* for the latest channel occupancy initiated by the UE, is available:  - If HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2 is provided by higher layers:  - The UE calculates the ratio between the number of received ‘ACK’ in the HARQ-ACK feedback and ~~[~~the number of UE(s) from which the corresponding ‘ACK’/’NACK’ in the HARQ-ACK feedback is expected~~]~~. If the calculated ratio is equal to or larger than *HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2*, go to step 1; otherwise go to step 4.  - Otherwise:  - If the HARQ-ACK feedback includes at least an ‘ACK’,go to step 1; otherwise go to step 4. |

**Agreement**

In SCI format 1-A, if higher layer parameter *transmissionStructureForPSCCHandPSSCH* in *SL-BWP-Config* is configured:

Table X: 2nd-stage SCI formats for SL operation in shared spectrum

|  |  |  |
| --- | --- | --- |
| **Value of 2nd-stage SCI format field** | **1 reserved bit (1st stage SCI)** | **2nd-stage SCI format** |
| 00 | 0 | SCI format 2-A (existing) |
| 1 | SCI format 2-A (COT-SI fields are provided) |
| 01 (Reserved) | 0 | Reserved |
| 1 | Reserved |
| 10 | 0 | SCI format 2-C (existing) |
| 1 | Reserved |
| 11 (Reserved) | 0 | Reserved |
| 1 | Reserved |

Note: it is up to the TS 38.212 spec editor on how to capture the above intention.

**Agreement**

Endorse the TP below for TS37.213

|  |  |
| --- | --- |
| ***Reason for change:*** | The current specification only mandates the UE to use the highest CAPC value among the associated CAPC values with the multiple TBs for performing the Type 1 channel access procedure. This does not include the case when S-SSB / PSFCH is transmitted within the same channel occupancy. |
|  |  |
| ***Summary of change:*** | It is clarified that within a channel occupancy initiated by Type 1 channel access procedure, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for the Type 1 channel access procedure. |
|  |  |
| ***Consequences if not approved:*** | The cases of PSFCH and S-SSB transmissions and stop-resume transmissions are not considered when determining the CAPC value for Type 1 channel access procedure. |

|  |
| --- |
| **< Start of text proposal >** 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  **<Unchanged part omitted>**  When a UE applies Type 1 channel access procedure to initiate a channel occupancy for multiple SL transmissions over one slot or multiple consecutive slots, the highest CAPC value among the associated CAPC values with the multiple SL transmissions is used for performing the Type 1 channel access procedure.  **<End of text proposal>** |

**Agreement**

TP#3 Proposal v2 in section 4.3.2 of R1-2310292 is endorsed for TS37.213 clause 4.5.6.3

**Agreement**

After UE successfully performed a multi-channel access procedure for a set of RB sets,

* A channel occupancy is initiated for the set of RB sets and the UE can use the initiated channel occupancy for own subsequent transmissions (including all S-SSB, PSFCH, PSCCH/PSSCH) when the channel access procedures described in clause 4.5.6.3 is used.
* When a channel occupancy is initiated using the channel access procedures described in clause 4.5.6.3 to transmit SL transmission(s), the channel occupancy can be shared to other UEs when the initiating UE transmits PSCCH/PSSCH in the SL transmission(s), and the channel occupancy time of each channel is the same in this case.

**Agreement**

TP#7 in section 4.7 of R1-2310292 is endorsed for TS 38.214 clause 8.1.4.

**Agreement**

Update the WA made in RAN1#114bis as follows.

|  |
| --- |
| **Working assumption (RAN1#113)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission.   + FFS: details of applying this prioritization, and if the reserved resource belongs to a MCSt, the COT initiating UE should be able to share the COT to cover the whole MCSt * (pre)configuring enabling/disabling option 2 is supportedOption 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation       * FFS: unless (pre-)configured or indicated by UE reserved resource in SCI   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - M is determined based on UE implementation (at least including 0)   + FFS: any restriction of M   + (pre)configuring enabling/disabling option 1 is supported * FFS: Whether the above high priority is determined according to a (pre)configured threshold * Note: both option1 and option2 are optional UE features |

**Agreement**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| type1-LBT-Blocking-Option2 | When enabled, if UE’s transmission in slot(s) before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission. | {enabled, disabled} | N/A | Per resource pool | UE-specific or Cell-specific |

**Agreement**

For a UE transmitting CPE between two consecutive SL transmissions by the same UE, when the gap between the two transmissions before applying CPE is one symbol in 15kHz and up to two symbol(s) in 30kHz and 60kHz,

* At least when the first of the two transmissions is PSCCH/PSSCH/PSFCH and the latter of the two transmissions is PSFCH/S-SSB, the UE follows the (pre-)configured CPE starting position for the PSFCH/S-SSB.
* When the latter of the two transmissions is PSCCH/PSSCH,
  + the CPE starting position index from [4, TS 38.211] for the PSCCH/PSSCH transmission
    - In one symbol gap: the index is always 1
    - In two symbols gap: the index is always 3 in 30kHz and 2 in 60kHz

**Agreement**

For the autonomous update to the next higher allowed value when the same value is consecutively used for X times for generation of ,

* The (pre-)configuration provides 1 value for X among a value range of {1, 8, 16, 32, ‘infinity’}.
* This operation is restricted only to PSCCH/PSSCH transmission with HARQ feedback indicator in SCI-2 is set to disabled, regardless of PSFCH resources being configured in a resource pool.

## RAN1#115 (13 – 17 November 2023)

**Agreement**

Introduce the following new RRC parameter for the agreement on autonomous update to the next higher allowed value when the same value is consecutively used for X times for generation of .

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** | **UE-specific or cell-specific** |
| CWSforPsschWithoutHarqAck | The latest CW\_p is autonomously increased to the next higher allowed value for every priority class p∈{1,2,3,4} if the same CW\_p ≠ CW\_(max,p) is consecutively used for general of N\_init in SL Type 1 LBT for a number of times indicated by this parameter. This operation is restricted only to PSCCH/PSSCH transmission(s) with "HARQ feedback enabled/disabled indicator" in the 2nd stage SCI set to disabled, regardless of PSFCH resources being configured in a resource pool. | {1, 8, 16, 32, ‘infinity’} | N/A | Per SL BWP | UE-specific or Cell-specific |

**Agreement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Default value aspect** | **Per (UE, cell, TRP, …)** |
| absenceOfAnyOtherTechnology | Presence of this field indicates absence on a long term basis (e.g. by level of regulation) of any other technology sharing the carrier; absence of this field indicates the potential presence of any other technology sharing the carrier, as specified in TS 37.213 [48] clauses ~~X.X.X~~ 4.5. | ENUMERATED {true} | N/A | Per cell / carrier |
| energyDetectionConfig | Indicates whether to use the maxEnergyDetectionThreshold or the energyDetectionThresholdOffset (see TS 37.213 [48], clause ~~X.X.X~~ 4.5.5). | CHOICE {maxEnergyDetectionThreshold, energyDetectionThresholdOffset} | N/A | ~~[~~Per cell / carrier~~]~~ |
| energyDetectionThresholdOffset | Indicates the offset to the default maximum energy detection threshold value. Unit in dB. Value -13 corresponds to -13dB, value -12 corresponds to -12dB, and so on (i.e. in steps of 1dB) as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5. | INTEGER (-13..20) | N/A | ~~[~~Per cell / carrier~~]~~ |
| maxEnergyDetectionThreshold | Indicates the absolute maximum energy detection threshold value. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm) as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5. | INTEGER (-85..-52) | N/A | ~~[~~Per cell / carrier~~]~~ |
| HARQ-ACKFeedbackRatioforContentionWindowAdjustment-GC-Option2 | Ratio threshold for contention window adjustment for SL groupcast option 2 as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.4. Unit is percentage. | ~~[~~INTEGER (10..100)~~]~~ | N/A | ~~[~~Per cell / carrier~~]~~ |
| CPEStartingPositionPSFCH | A CPE starting position within the GP symbol before PSFCH transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | ~~[~~INTEGER (1..X)~~]~~ | N/A | Per resource pool |
| CPEStartingPositionS-SSB | A CPE starting position within the GP symbol before S-SSB transmission. The value is an index of the set of all candidate CPE starting positions specified in Table 5.3.1-3 of [16, TS38.211] for Ci=1 and the corresponding SCS of the SL BWP. | ~~[~~INTEGER (1..X)~~]~~ | N/A | Per SL BWP |

**Agreement**

Confirm the below working assumption on Type 1 LBT blocking with following modifications.

|  |
| --- |
| **Working assumption (RAN1#114bis)**  For Type 1 LBT block issue (inter-UE case), the following option 2 and option 1 are supported separately based on UE capability   * Option 2: If transmission in slot(s) at least before a reserved resource is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission.   + (pre)configuring enabling/disabling option 2 is supported * Option 1:   + UE may avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource.     - The value of N can be selected from {0, 1, 2}     - The selection of the value of N is up to UE implementation   + UE may avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource.     - The value of M can be selected from {0, 1, 2}     - M is determined based on UE implementation   + (pre)configuring enabling/disabling option 1 is supported * Note: both option1 and option2 are optional UE features |

**Agreement**

Confirm the working assumption with the following modifications

|  |
| --- |
| **Working assumption (RAN1#113)**  For UE-to-UE COT sharing in SL-U, a parameter “*ue-toUE-COT-SharingED-Threshold*” is (pre-)configured per SL carrier/cell to be used in the energy detection threshold adaptation procedure   * The UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s). |

**Agreement**

**Modify higher layer parameter “*ue-toUE-COT-SharingED-Threshold*” according to the following.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Param Name** | **Description** | **Value range** | **Per (UE, cell, TRP, …)** | **Required for initial access or IDLE/INACTIVE** |
| ue-toUE-COT-SharingED-Threshold | ~~Maximum~~ The energy detection threshold that ~~the~~ is to be used by a UE to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use this configured parameter for accessing the channel(s) ~~with another UE for SL transmission~~ as specified in TS 37.213 [48], clause ~~X.X.X~~ 4.5.5 for sidelink channel access. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm). | ~~[~~INTEGER (-85..-52)~~]~~ | ~~[~~Per cell / carrier~~]~~ | ~~[~~UE-specific or Cell-specific~~]~~ |

**Agreement**

**The TP below for TS 37.213 is endorsed.**

|  |  |
| --- | --- |
| ***Reason for change:*** | Time required for the COT initiator to detect a responder UE’s PSFCH and S-SSB transmission(s) for resuming its own channel occupancy is expected to be longer than 1-symbol gap. In order for the initiator to resume using its own COT immediately after responder’s PSFCH and S-SSB, it is necessary to detect responder’s PSFCH and S-SSB transmissions based on an expected manner. |
|  |  |
| ***Summary of change:*** | To match the same wordings used in NR-U to resolve the “expected” behaviour. |
|  |  |
| ***Consequences if not approved:*** | The COT initiator UE cannot immediately resume transmission in its own COT using Type 2B and 2C channel access procedures after responder’s PSFCH and S-SSB transmissions. |

|  |
| --- |
| **< Start of text proposal >** 4.5.3 SL channel access procedures in a shared channel occupancy **<Unchanged part omitted>**  When a UE uses channel access procedures to initiate a channel occupancy to transmit SL transmission(s) and shares the corresponding channel occupancy with another UE that transmits a SL transmission(s), the UE that initiated the channel occupancy may transmit a SL transmission(s) within its channel occupancy that follows the SL transmission(s) from the other UE as the following.  - If the UE determines a transmission gap from the other UE’s SL transmission(s), the followings are applicable:  - If the transmission gap is at least , the UE can transmit the SL transmission on the channel after performing Type 2A channel access procedures as described in clause 4.5.2.1.  - If the transmission gap is , the UE can transmit the SL transmission on the channel after performing Type 2B channel access procedures as described in clause 4.5.2.2.  - If the transmission gap is up to , the UE can transmit the SL transmission on the channel after performing Type 2C channel access as described in clause 4.5.2.3.  - Otherwise, the UE can transmit the SL transmission on the channel after performing Type 2A channel access procedures as described in clause 4.5.2.1.  **<End of text proposal>** |

**Agreement**

**TP#7 in Section 4.7.1 of R1-2312250 for TS 38.214 is endorsed.**

**Agreement**

**Endorse the TP below for TS 37.213.**

|  |  |
| --- | --- |
| ***Reason for change:*** | Currently UE-to-UE COT sharing energy detection threshold is determined by a UE based on the UE’s transmit power. But a responder UE could use different transmit power to the power used by the COT initiator UE. |
|  |  |
| ***Summary of change:*** | The UE-to-UE COT sharing energy detection threshold that should be used by both the initiator UE and the responder UE should be (pre-)configured per carrier/cell.  A condition is added to clarify that the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s). |
|  |  |
| ***Consequences if not approved:*** | The responder’s UE transmit power may not complied to the “*ue-toUE-COT-SharingED-Threshold*” calculated based on initiator’s transmit power. |

**< Start of text proposal >**

**4.5.5 Energy detection threshold adaptation procedure**

**<Unchanged part omitted>**

If the higher layer parameter *sl-absenceOfAnyOtherTechnology-r1*8is not configured to a UE,the UE that performs channel access procedures to initiate a channel occupancy to be shared to other UE(s), and another UE that shares the initiated channel occupancy as described in section 4.5.3 shall use the (pre-)configured “*ue-toUE-COT-SharingED-Threshold*” for accessing the channel(s).

For the case where a UE performs channel access procedures as described in clause 4.5.1 for SL transmission(s) and indicates channel occupancy sharing information, is set equal to the value provided by the higher layer parameter *ue-toUE-COT-SharingED-Threshold*.

**<End of text proposal>**

**Agreement**

TP#4 in Section 4.4.1 of R1-2312251 for TS 37.213 is endorsed.

**Agreement**

TP#3 in Section 4.3.1 of R1-2312251 for TS 37.213 is endorsed.

**Agreement**

TP#5 in Section 4.5.1 of R1-2312251 for TS 38.214 is endorsed.

**Agreement**

Endorse the TP below for **TS 37.213.**

|  |  |
| --- | --- |
| ***Reason for change:*** | In NR-U and LAA, channel access procedures are supported for consecutive UL transmissions and UL transmissions with multiple starting positions. Such behaviour is also a common understanding for SL-U operation. |
|  |  |
| ***Summary of change:*** | Added description to support UE performing channel access procedures for continuous SL transmissions and multiple starting positions in a slot. |
|  |  |
| ***Consequences if not approved:*** | Since the behaviour is captured for NR-U and LAA specification, if these are not captured for SL-U, it may be interpreted that these are not supported in SL-U. |

|  |
| --- |
| **< Start of text proposal >** 4.5 Sidelink Channel access procedures A UE operating in sidelink resource allocation mode 1 or mode 2 and performing SL transmission(s) on channel(s) shall perform the procedures described in this clause for the UE to access the channel(s) on which the transmission(s) are performed.  **<Unchanged part omitted>**  For contiguous SL transmission(s), the following are applicable:  - If a UE is scheduled or autonomous selected to transmit a set of SL transmissions using one or more selected SL grant(s), and  - if the UE cannot access the channel for a transmission in the set prior to the last transmission according to Type 1 or Type 2 SL channel access procedures, the UE shall attempt to transmit the next transmission according to Type 1 or Type 2 SL channel access procedures.  - if the UE cannot access the channel for a transmission in the set prior to the last transmission according to Type 2B SL channel access procedure, the UE shall attempt to transmit the next transmission according to Type 2A SL channel access procedure.  For SL transmission(s) with multiple starting positions in a slot, the following are applicable:  - If a UE intends to transmit PSCCH/PSSCH in sidelink resource allocation mode 1 or mode 2 using a Type 1 channel access procedure, and if the UE cannot access the channel for the transmission from the 1st starting symbol of a slot, the UE shall attempt to transmit PSCCH/PSSCH from the 2nd starting symbol in the same slot according to Type 1 channel access procedure. There is no limit on the number of attempts the UE can make using Type 1 channel access procedure.  - If a UE intends to transmit PSCCH/PSSCH in sidelink resource allocation mode 1 or mode 2 using a Type 2 channel access procedure, and if the UE cannot access the channel for the transmission from the 1st starting symbol of a slot, the UE may attempt to transmit PSCCH/PSSCH from the 2nd starting symbol in the same slot and according to Type 2 channel access procedure.  **<End of text proposal>** |

**Agreement**

TP#2 in Section 4.2.2 of R1-2312253 for TS 37.213 is endorsed.

**Agreement**

The TP below is endorsed for TS 37.213.

|  |
| --- |
| **< Start of text proposal >** 4.5.6 Channel access procedures for transmission(s) on multiple channels **<Unchanged part omitted>**  the followings are applicable:  - Type A or Type B procedures described in clause 4.5.6.1 and 4.5.6.2, respectively, can be used for accessing multiple channels only for PSFCH or S-SSB transmissions.  - A UE can access multiple channels on which SL transmissions are performed, according to the procedures described in clause 4.5.6.3. 4.5.6.1 Type A multi-channel access procedures for PSFCH or S-SSB transmissions The procedures described in this clause are applicable for PSFCH/S-SSB transmissions.  A UE shall perform channel access on each channel , according to the procedures described in clause 4.5.1, where is a set of channels on which the UE intends to transmit, and , and is the number of channels on which the UE intends to transmit.  The counter described in clause 4.5.1 is determined for each channel and is denoted as . is maintained according to clause 4.5.6.1.1 or 4.5.6.1.2.  **<Unchanged part omitted>** 4.5.6.2 Type B multi-channel access procedures for PSFCH or S-SSB transmissions The procedures described in this clause are applicable for PSFCH/S-SSB transmissions.  **<Unchanged part omitted>**  For the procedures in this clause, the channels of the set of channels selected by the UE for PSFCH transmissions, is a subset of the RB sets in the (pre-)configured sidelink resource pool. 4.5.6.2.1 Type B1 multi-channel access procedure A single value is maintained for the set of channels . 4.5.6.2.2 Type B2 multi-channel access procedure A value is maintained independently for each channel using the procedure described in clause 4.5.4.  For determining for channel , value of channel is used, where is the channel with largest among all channels in set .  **<End of text proposal>** |

|  |  |
| --- | --- |
| ***Reason for change:*** | Currently, the Type A and Type B multi-channel procedures are supported only for PSFCH transmissions, but not for other SL channels and signals. And the initiated channel occupancy cannot be used for any subsequent SL transmissions. |
|  |  |
| ***Summary of change:*** | To enable the support for S-SSB transmissions using Type A and Type B multi-channel access procedures, and enabling the support for own subsequent PSFCH and S-SSB transmissions within the initiated channel occupancy. |
|  |  |
| ***Consequences if not approved:*** | Type A and Type B multi-channel procedures are not supported for S-SSB transmissions, and the initiated channel occupancy cannot be used for any subsequent SL transmissions. |

**Agreement**

The TP below is endorsed for TS38.214

**< Start of text proposal >**

**8.1.4 UE procedure for determining the subset of resources to be reported to higher layers in PSSCH resource selection in sidelink resource allocation mode 2**

In resource allocation mode 2, the higher layer can request the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission. To trigger this procedure, in slot *n,* the higher layer provides the following parameters for this PSSCH/PSCCH transmission:

**<Unchanged part omitted>**

7a) If sidelink DRX active time of RX UE is provided by the higher layer and there is no candidate single-slot or multi-slot resource remained within the sidelink DRX active time in the set , the UE based on its implementation additionally selects and includes at least one candidate single-slot resource or at least one candidate multi-slot resource within the sidelink DRX active time in the set .

**<End of text proposal>**

## RAN1#116 (26 February – 01 March 2024)

**Agreement**

TP#1 (editorial corrections) in Section 4.1.1 of R1-2401529 for TS 37.213 is endorsed.

**Agreement**

TP#2 in Section 4.2.1 of R1-2401529 for TS 37.213 Clause 4.5.3 is endorsed.

**Agreement**

TP#3 in Section 4.3.1 of R1-2401529 for TS 37.213 Clause 4.5.3 is endorsed.

**Agreement**

TP#4 in Section 4.4.1 of R1-2401529 for TS 37.213 Clause 4.5.3 is endorsed.

**Agreement**

TP#5 in Section 4.5.1 of R1-2401529 for TS 37.213 Clause 4.5.6.1 is endorsed.

**Agreement**

TP#7 in Section 4.7.1 of R1-2401529 for TS 37.213 Clause 4.5.3 and 4.5.6 is endorsed.

**Agreement**

TP#17 in Section 4.17.1 of R1-2401529 for TS 38.214 Clause 8.1.2.1 is endorsed.

**Agreement**

TP#8 in Section 4.8.1 of R1-2401529 for TS 37.213 Clause 4.5.4 is endorsed.

**Agreement**

TP#12 in Section 4.12.1 of R1-2401529 for TS 37.213 Clause 4.5.5.1 is endorsed.

**Agreement**

TP#6 in Section 4.6.1 of R1-2401530 for TS 37.213 Clause 4.5.6.2 is endorsed.

**Agreement**

The TP below is endorsed for TS38.211

* Note to the editor: the bracket and the comma are also newly added (but don’t show in red in the TP below)

|  |  |
| --- | --- |
| Reason for change: | Length-zero CPE has been agreed in RAN1 and currently this is not reflected in TS 38.211. For the sidelink channels, i=0 currently results in an undefined value of T\_ext and consequently no possibility to indicate T\_ext=0 in line with the agreement. |
|  |  |
| Summary of change: | Reuse the NR-U equation for dynamically scheduled PUSCH, SRS, and PUCCH transmissions. Using index from Table 5.3.1-3 would identify a CPE with length zero. |
|  |  |
| Consequences if not approved: | The agreed length-zero CPE remains unusable in the specification. |

**< Start of text proposal >**

**5.3.1 OFDM baseband signal generation for all channels except PRACH and RIM-RS**

**<Unchanged part omitted>**

- for PSCCH/PSSCH, PSFCH, and S-SS/PSBCH block transmission

where and are given by Table 5.3.1-3 with the index given by the procedure in [5, TS 38.213] or [6, TS 38.214].

**<End of text proposal>**

**Agreement**

TP#18 in Section 4.18.1 of R1-2401530 for TS 38.214 Clause 8.1.4 is endorsed

* Note to the editor: the text asks to start a new paragraph (not to add that text in the specs).

**Agreement**

TP#9 in Section 4.9.1 of R1-2401530 for TS 37.213 Clause 4.5 is endorsed without “, respectively”.

**Agreement**

TP#10 in Section 4.10.1 of R1-2401530 for TS 37.213 Clause 4 is endorsed.

**Agreement**

TP#11 in Section 4.11.1 of R1-2401530 for TS 37.213 Clause 4.5.1 is endorsed.

**Agreement**

TP#19 in Section 4.19.1 of R1-2401530 for TS 38.213 Clause 16.5 is endorsed.

**Conclusion**

When a UE resumes SL transmission(s) within its own COT, the CAPC value corresponding to the SL transmission(s) is at most equal to the CAPC value used to initiate the channel occupancy.

**Agreement**

* **The TP below for TS 37.213 Clause 4.5.6.3 is endorsed.**
* **Value ‘0’ is included in the RRC parameter “***intraCellGuardBandsSL-List***” with the following note to the provided as part of the update to the RRC parameter**
* **Note, the value ‘0’ is not expected to be (pre-)configured when the SL BWP is larger than UE supported RF bandwidth for SL-U operation.**

|  |  |
| --- | --- |
| Reason for change: | Currently, square brackets are still in place for a paragraph in the multi-channel access procedures for SL transmissions. |
|  |  |
| Summary of change: | Removal of the square brackets. |
|  |  |
| Consequences if not approved: | It remains unclear whether a UE can transmit on a channel within the bandwidth of a carrier if the UE fails to access any of the channels of the SL bandwidth part when no intra-cell guard band(s) is configured. |

**< Start of text proposal >**

**4.5.6.3 Multi-channel access procedures for SL transmissions**

**<Unchanged part omitted>**

- the UE may not transmit on channel within the bandwidth of a carrier, if the UE fails to access any of the channels, of the carrier bandwidth, on which the UE is scheduled or configured with or selects SL resources.

- the UE may not transmit on a channel within the bandwidth of a carrier if the UE is configured without intra-cell guard band(s) on an SL bandwidth part as described in clause 7 of [8], and the UE fails to access any of the channels of the SL bandwidth part.

**<End of text proposal>**

**Agreement**

The TP below is endorsed to clearly define the remaining COT duration that can be shared / transmitted by other UE(s).

|  |  |
| --- | --- |
| Reason for change: | It is incorrect to say the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot . In fact, the starting slot where other UE(s) can start SL transmission(s) should take into account of the UE processing time. |
|  |  |
| Summary of change: | Refine the sentence to define the remaining channel occupancy duration is starting from the end of slot and ending at slot .  or  To clearly state that the duration within which other UE(s) can use a shared channel occupancy for SL transmission(s) starts from the end of slot and ending at slot . |
|  |  |
| Consequences if not approved: | The specification remains incorrect on the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot . |

**< Start of text proposal >**

**4.5.3 SL channel access procedures in a shared channel occupancy**

**< Unchanged parts are omitted >**

When a UE initiates a channel occupancy using the channel access procedures described in clause 4.5.1 or clause 4.5.6.3 on a channel(s) to transmit SL transmission(s), the UE can provide a channel occupancy sharing information in SL control information that includes at least the Layer 1 source and destination IDs, the corresponding channel access priority class, the remaining channel occupancy duration, and the frequency domain information for the applicable RB set(s) of the channel occupancy. The channel occupancy sharing information can also include additional IDs and associated cast type. The additional IDs includes one pair of Layer 1 source and destination IDs for all cast types, where the source ID is set to the source ID of the UE initiating channel occupancy for unicast and to the reserved bits for groupcast and broadcast. The channel occupancy sharing information transmitted in slot , can indicate the remaining channel occupancy duration in a number of slot(s) . If , the initiated channel occupancy by the UE shall not be shared for SL transmission(s) by other UE(s). Otherwise, the initiated channel occupancy by the UE can be shared for SL transmission(s) by other UE(s) within a duration starting from the end of slot and ending at slot .

**< End of text proposal >**

**Agreement**

The draft LS to RAN2 in R1-2401755 is endorsed. Final LS in R1-2401756.

**Conclusion**

**It is concluded that UE can utilize a shared COT only if its SL transmission(s) is fully inside the shared channel occupancy indicated by the RB set(s) and up to the remaining COT duration in the COT-SI, which does not require any specification change.**

* **Note: The portion of the SL transmission(s) overlapping with the shared COT can be transmitted**

**Agreement**

The TP for TS 37.213 in Proposal 3-6 (I) in (the second) section 3.3.3 in R1-2401531 is endorsed.

## RAN1#116bis (15 – 19 April 2024)

**Agreement**

Adopt editorial correction TP#1 in Section 4.1.1 of R1-2403454 for TS 38.211 v18.2.0.

**Agreement**

Adopt editorial correction TP#2 in Section 4.2.1 of R1-2403454 for TS 38.212 v18.2.0

**Agreement**

Adopt editorial correction TP#3 in Section 4.3.1 of R1-2403454 for TS 38.213 v18.2.0

**Agreement**

Adopt editorial correction TP#5 in Section 4.5.1 of R1-2403454 for TS 37.213 v18.2.0

* Except all the changes with “channel(s) including” and “channels including the”

**Conclusion**

**It is concluded that no spec change is needed for the issue of CPE determination for multiple TBs in R1-2403295.**

**Conclusion**

**It is concluded that no spec change is needed for the issue of no sensing result for CPE determination in R1-2403296.**

**Conclusion**

It is concluded that no spec change is needed for the issue of COT sharing flag in R1-2402219.

**Agreement**

Adopt TP#15 in Section 4.15.1 of R1-2403454 for TS 37.213 Clause 4.5.6.3

**Agreement**

Adopt TP#16 in Section 4.16.1 of R1-2403454 for TS 37.213 Clause 4.5.

**Agreement**

**The final LS in R1-2403578 is agreed.**

**Agreement**

Adopt TP#15 in Section 4.15.1 of R1-2403454 for TS 37.213 Clause 4.5.6.3. Final CR agreed in R1-2403580.

**Agreement**

Adopt TP#16 in Section 4.16.1 of R1-2403454 for TS 37.213 Clause 4.5. Final CR agreed in R1-2403579.

## RAN1#117 (20 – 24 May 2024)

TBD