**3GPP TSG RAN WG1 Meeting #114 R1-230xxxx**

**Toulouse, France, August 21 – 25, 2023**

**Agenda item: 9.17**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary on email discussion on Sidelink enhancements**

**Document for: Discussion and Decision**

# 1 Introduction

This thread will discuss the draft CR to 38.214 for the Sidelink enhancements.

First checkpoint for this discussion: **September 5, 6:00 UTC**!

# 2 Discussion – first round

The comments in this section are based on version 0 of the the draft CR available in the **Post RAN1#114 discussion.**

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| --- | --- | --- |
| Company | Comments | Editor reply/Notes |
| LGE | On Section 8.1.2.1, there is some typo.  For operation with shared spectrum channel access in frequency range 1, for the first ~~U~~SL transmission to initiate a channel occupancy  Moreover, according to the following WA, the above scheme is applied for the case when UE performs Type 2A to transmit PSCCH/PSSCH within the shared COT as well.  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   In addition, Scheme 1 also needs to be captured as well as Scheme 2 in this part.  **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   In those points of views, we suggest following text:  For operation with shared spectrum channel access in frequency range 1, for the first SL transmission to initiate a channel occupancy or within a shared channel occupancy the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen to be default value provided by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT* if the resource for the SL transmission is indicated by a SCI format 1-A of the UE or if the SL transmission is in a slot where it is assumed that SL transmission of another UE occurs or be chosen randomly from a set of values for the priority of the SL transmission configured by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT, otherwise*.  On the section 8.1.4, it would be necessary to consider RB set concepts as well including the number of consecutive RB sets and the update on the definition of candidate resource. MCSt also needs to be captured.  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 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   So, we suggest to add following text.  In the parameters provided by higher layer  - Optionally, a number of consecutive slots for multi-consecutive slot transmission,  In step 1:  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, A candidate single-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* within a set of contiguous RB sets with RB set *z+k* in slot where and .  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB’ and if is provided, A candidate multi-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* within a set of contiguous RB sets in consecutive slots starting from slot where .  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’ and if is provided, A candidate multi-slot resource for transmission is defined as a set of contiguous sub-channels with sub-channel *x+j* within a set of contiguous RB sets with RB set *z+k* in consecutive slots starting from slot where and .  For the remaining parts, it can be considered to replace “candidate single slot resource R\_x,y” with “candidate resource R\_x,y or R\_x,y,z”.  On Section 8.1.2.2, the lowest sub-channel needs to be clarified as per the following agreement. According to NR-U interlace definition, it is possible that the subchannel with lowest index does not occupy the actual lowest frequency region.  **Agreement**  For interlace RB-based PSCCH/PSSCH transmission in SL-U, support the following:   * Option 1: lowest sub-channel is the sub-channel with smallest sub-channel index   The lowest sub-channel index for sidelink transmission is the sub-channel on which the lowest PRB of the associated PSCCH is transmitted.  On section 8, the definition of subchannel for interlaced RB-based transmission would need to be more clarified as per the following agreement.  **Agreement**  For interlace RB-based PSCCH/PSSCH transmission in SL-U:   * Regarding mapping between sub-channel and interlace, 1 sub-channel is defined and indexed within 1 RB set, and is periodically indexed across different RB sets within the resource pool * If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, in the frequency domain, a sidelink resource pool consists of sl-NumSubchannel sub-channels, where each sub-channel ~~is given by the higher layer parameter~~ consists of *numInterlacePerSubchannel* contiguous interlace indices ~~interlaces~~. | Thanks, corrected.  Agree, this part will be revised accordingly  Agree (To be checked)  Agree, will be updated  Agree, except that a subchannel consists of interlaces rather than interlace indices. Updated as:  where each sub-channel consists of *numInterlacePerSubchannel* interlaces having contiguous interlace indices. |
| CATT/GH | Thanks the editor for the great efforts on drafting the CR! Please find our comments below.   * **Comment 1 (**Clause 8.1):   + “COT sharing cast type” is missed as one of the fields in SCI format 2-A.  |  | | --- | | - the UE shall set value of the ‘*CAPC*’ field as indicated by higher layers.  - the UE shall set value of the ‘*COT sharing cast type*’ field as indicated by higher layers.  - the UE shall set value of the ‘*Additional ID’* field as indicated by higher layers.  - the UE shall set value of the ‘*Remaining COT duration’* field as indicated by higher layers. |  * **Comment 2 (**Clause 8.1):   + In order to align with TS 38.212, the newly added fields in SCI format 2-B and SCI format 2-C should be deleted. * **Comment 3 (**Clause 8.1.2.1):   + CPE determination agreements for PSCCH/PSSCH transmission should be captured.  |  | | --- | | **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   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 |  * **Comment 4 (**Clause 8.1.2.1):   + Regarding the candidate starting symbol(s), the case that only one candidate starting symbol is supported for slot with PSFCH symbols, as following agreement, is not captured.   **Agreement**  Slots with PSFCH symbols only have 1 candidate starting symbol for PSCCH/PSSCH.   * **Comment 5 (**Clause 8.1.4):   + The legacy description on *LsubCH* can be removed.  |  | | --- | | - the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ; |  * **Comment 6 (**Clause 8.1.4):   + The wording should be aligned with RAN2, where “consecutive LBT failure” should be changed to “consistent LBT failure” * **Comment 7 (**Clause 8.1.4):   + The following highlight part is redundant and may cause some ambiguity, which can be removed.  |  | | --- | | If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', the UE shall exclude candidate single-slot resource, whose lowest sub-channel of a RB set includes resource blocks of the intra-cell guardband PRBs, configured by higher layer parameter, *intraCellGuardBandsSL-List*. |   Agreement  Regarding “*For contiguous RB-based PSCCH/PSSCH transmission in SL-U, regarding sub-channel(s) which include intra-cell guardband PRBs, support only option 3*” and “*Option 3: Such sub-channel(s) cannot be used for PSCCH transmission, and can be used for PSSCH transmission*”:   * Candidate resource, whose lowest sub-channel includes intra-cell guardband PRBs, is excluded   + Such exclusion is performed in PHY layer, and such candidate resource is excluded in Step 1 * **Comment 8 (**Clause 8.1.4):   + The detail designs on enhancements for resource selection procedure considering C-LBT need further discussion, such as which step is applied, the following parts should be removed.  |  | | --- | | If *rbSetsWithConsecutiveLBTFailure* is provided, the UE shall exclude candidate single-slot resources, whose associated RB sets is included in the *rbSetsWithConsecutiveLBTFailure* parameter. |  * **Comment 9 (**Clause 8.1.4):   + the following agreements regarding candidate multi-slots resources should **also** be captured in clause 8.1.4.  |  | | --- | | 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 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 | | Comment 1:  Agree, updated accordingly.  Comment 2:  This can be revisited after there is conclusion on how to treat this for 38.212  Comment 3:  Agree, will be added  Comment 4:  Agree, will be added  Comment 5:  To be checked  Comment 6:  Agree  Comment 7:  To be checked  Comment 8:  Ok to remove (need to double check this still)  Comment 9:  Agreed |
| Vivo/vivo2/vivo3 | 1. For CPE determination for PSCCH/PSSCH COT initiating in section 8.1.2.1, the default CPE part is not captured, and how to select CPE based on resource reservation is not captured neither.   114 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   1. Some modification for the current CPE part based on above agreement.   For operation with shared spectrum channel access in frequency range 1, for the first ~~UL transmission~~ SL PSCCH/PSSCH transmission by the COT initiating UE in ~~the to initiate~~ a channel occupancy the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen randomly from a set of values configured by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT according to the priority of the* PSCCH/PSSCH transmission.   1. For In-COT case, i.e., COT sharing or SL burst, the CPE determination rule should be captured in 8.1.2.1 as well   **113 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 16µs.  114 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  [vivo2]   1. Restriction on the alignment between LTE SL subframe and NR sidelink slots should be captured.   WID:   * + For NR PSCCH/PSSCH transmissions in 30kHz SCS, NR SL UE selects in MAC layer at least the first of NR SL slots overlapping with an LTE SL subframe, and can select the subsequent overlapping NR SL slot in MAC layer     - No change to the R16/17 resource allocation procedure in PHY due to this restriction     - The existing SL slot structure from Rel-16 is unchanged     - The starting symbol of the first of the overlapping NR SL slots is assumed to be aligned with the first symbol of the LTE SL subframe   According to WID, for Rel-18 coex when NR SL UE performs PSCCH/PSSCH transmissions in 30kHz SCS, the starting symbol of the first overlapping NR SL slot is assumed to be aligned with the first symbol of the LTE SL subframe. Otherwise, the first overlapping NR SL slot may locate in the second half of the LTE subframe and leads to AGC issue. Hence, the following change is proposed.   |  | | --- | | 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 report set to higher layers.  For dynamic co-channel coexistence of LTE sidelink and NR sidelink, and for NR sidelink with SCS configuration in slots that overlap with an E-UTRA subframe on the sidelink, the UE expects that the starting of the first symbol of the earlier overlapping NR slot is aligned with the starting of the first symbol of the E-UTRA sidelink subframe. |   [vivo3]   1. in 8.1.3.2  |  | | --- | | - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *startingSymbolFirst* and *startingSymbolSecond* are provided for a sidelink resource pool, the number of sidelink symbols assumed in transport block size determination is determined by a reference number of symbols, *numRefSymbolLength*, provided by higher layers. |   **Agreement**  If a resource pool includes slots with 2 candidate starting symbols for a PSCCH/PSSCH transmission, for TBS determination and 2nd SCI overhead, in TS 38.214 Clause 8.1.3.2:   * *L\_ref* replaces *sl-LengthSymbols*   + Value range of *L\_ref* is {7, 8, 9, 10, 11, 12, 13, 14} symbols * is determined in the same way as in legacy NR SL   According to the agreement, when the pool has two starting symbols, *L\_ref* replaces *sl-LengthSymbols*. This means = *numRefSymbolLength*-2, and *numRefSymbolLength*, rather than in the formula, is determined by the reference number of symbols. Thus, the agreement is not correctly reflected, we suggest the following change:   |  | | --- | | - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *startingSymbolFirst* and *startingSymbolSecond* are provided for a sidelink resource pool, = *numRefSymbolLength*-2 , where *numRefSymbolLength* is a reference number of symbols provided by higher layers. | | Comment 1:  Agree  Comment 2:  Some revision is needed, double check the wording  Comment 3:  Agree  Comment 4:  Will consider in a future update! |
| ZTE,Sanechips | （1）As sl-NumSubchannel is number of subchannels within a RB set as defined in 8.1.5, and only subchannel with continuous interlace is agreed, in order to avoid any misunderstanding, a corresponding modification is needed for beginning part of chapter 8 :   * If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, in the frequency domain, a sidelink resource pool consists of contiguous sl-NumRBset RB sets and sl-NumSubchannel sub-channels in each RB set, where each sub-channel is given by the higher layer parameter *numInterlacePerSubchannel* contiguous interlaces.   Another paragraph in chapter 8  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, the sub-channel *m* for consists of a set of *numInterlacePerSubchannel* continuous interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211]. The lowest RB in the resource pool is given by the higher layer parameter *startRBResourcePool*. 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* contiguous interlace(s) with the same index(s) in different RB sets. Sub-channel#m is mapped toK contiguous interlace(s) starting from interlace#m\*K . is the number of subchannels in each RB set of the resource pool given by the higher layer parameter sl-NumSubchannel.   1. In 8.1.2.1, as two schemes are agreed for the CPE determination for Type 1 channel access to initiate a COT, but it seems that only scheme 2 is captured, so it is suggested that:   - For operation with shared spectrum channel access in frequency range 1, for the first UL transmission to initiate a channel occupancy the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen randomly from a set of values configured by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT* if neither a resource reservation is transmitted nor resource reservations is detected for the slot and the RB set(s) of the intended PSCCH/PSSCH transmission*,*otherwise the (pre-)configured default CPE starting position is applied.  3 ) Regarding set of subframes part for co-channel coexistence, because it was specified as “The set of subframes that may belong to a PSSCH resource pool for sidelink transmission mode 3 or 4 is denoted by in 36.213”. Therefore, the modification suggestions are as follows in blue font.  “For dynamic co-channel coexistence of LTE sidelink and NR sidelink, denotes the set of subframes that may belong to an LTE sidelink resource pool as defined in clause 14.1.5 of [19, TS36.213].”   1. Regarding 2LTE) part for co-channel coexistence, it does not refer to the LTE sensing window, but the shared information window used by NR SL module. In addition, n should be the time where NR SL module triggers its NR SL resource (re)selection procedure. Therefore, the modification suggestions are as follows in blue font.   “2LTE) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The information sharing window that NR will use from within UE is defined by the range of LTE subframes [], where is the NR slot where NR SL module triggers its NR SL resource (re)selection procedure, is 1100 msec and is up to UE implementation under ; is 4+T msec, where T ≤ 4 msec. The UE shall perform the procedures in 5LTE3 and 6LTE based on PSCCH decoded and RSRP measured in these LTE subframes.” | (1) Agree  (2) Agree, check the detailed wording  (3) Agree  (4) Regarding “sensing window / shared information window”, this was controversial at RAN1#113 and may be easier to resolve at the next meeting. Regarding n, it is already defined in the first paragraph of the clause since Rel-16, so there should be no need to define it here again. |
| **Huawei, HiSilicon** | Thanks for great efforts the draft, pleas find our **Comments for SL-U Channel Access.**  **Comment #1: CPE starting position**  **Reason for change:**   * **Change #1:** One typo, it should be “first SL transmission to initiate a channel occupancy” rather than “first UL transmission to initiate a channel occupancy”. * **Change #2:** Based on the agreement below, the detail of how to use CPE for transmission initiating a COT has not been captured clearly, and we suggest the wording as below.  |  | | --- | | **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 |   **Suggested Changes:**   |  | | --- | | **#TS 38.214 Clause 8.1.4#**  <omitted text>   * For operation with shared spectrum channel access in frequency range 1, for the first ~~UL~~SL transmission to initiate a channel occupancy , and if no a resource reservation is transmitted or resource reservations is detected for the slot and the RB set(s) of the intended PSCCH/PSSCH transmission, the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen randomly from a set of value(s) configured per priority of the PSCCH/PSSCH by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT*. Otherwise, use a configured default cyclic prefix extension *Text* indicated by *DefaultCPEStartingPositionsPSCCH-PSSCH-InitiateCOT.*   <omitted text> |  * **Change #3**: The agreement for CPE determination inside a COT as following is not captured. We kindly ask editor to capture the agreement in the next version and an example is suggested as below as well.  |  | | --- | | **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 |   **Example for capturing the agreement:**   |  | | --- | | **8.1.2.1 Resource allocation in time domain**  ...  - For operation with shared spectrum channel access in frequency range 1, for the SL transmission in a shared channel occupancy initiated by another UE*,* the shared UE determines a duration of a cyclic prefix extension *Text* according to indicated by higher layer parameter *DefaultCPEStartingPositionsPSCCH-PSSCH-SharedCOT* by default.When multiple CPE starting positions for sharing a COT is provided by *CPEStartingPositionsPSCCH-PSSCH-SharedCOT,* shared UE determines a duration of a cyclic prefix using the same method for the case the UE initiates a channel occupancy. |   **Comment #2 for MCSt**  **Reason for change:**  The following agreements on MCSt are not captured in Mode 2 resource allocation, we kindly ask editor could reflect it in the next update. An example is also provided as reference, detailed description is up to editor.   |  | | --- | | 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 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 |   **Example for capturing the agreements:**   |  | | --- | | **#TS 38.214 Clause 8.1.4#**  <omitted text>  - the resource pool from which the resources are to be reported;  - L1 priority, ;  - the remaining packet delay budget;  - 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.  - the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ;  - optionally, number of consecutive slots for Multi-consecutive slots transmission, .  - optionally, the resource reservation interval, , in units of msec.  <omitted text>  The following steps are used:  1) If a number of consecutive slots is provided with value larger than 1, the candidate multi-slots resource definition is applied. Otherwise, the candidate single-slot resource definition is applied. If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', a candidate multi-slots resource is defined as a set of contiguous sub-channels starting from sub-channel in consecutive slots starting from slot . If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, a candidate multi-slots 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. 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 one candidate multi-slots resource for UE performing full sensing, in a set of *Y* candidate slots within the time interval correspond to one candidate single-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 for UE performing at least contiguous partial sensing and resource (re)selection triggered by aperiodic transmission (), where  <omitted text>  The total number of candidate single-slot resources or candidate multi-slots resources is denoted by .  <omitted text>  4) The set is initialized to the set of all the candidate single-slot resources or candidate multi-slots resources.  5) The UE shall exclude any candidate single-slot resource */* or candidate multi-slots resource */* from the set if it meets all the following conditions:  - the UE has not monitored slot in Step 2.  - for any periodicity value allowed by the higher layer parameter *sl-ResourceReservePeriodList* and a hypothetical SCI format 1-A received in slot with '*Resource reservation period*' field set to that periodicity value and indicating all subchannels of the resource pool in this slot, condition c in step 6 would be met.  5a) If the number of candidate single-slot resources */* or candidate multi-slots resources */* remaining in the set is smaller than , the set is initialized to the set of all the candidate single-slot resources or candidate multi-slots resources as in step 4.  6) The UE shall exclude any candidate single-slot resource */* or candidate multi-slots resource */* from the set if it meets all the following conditions:  <omitted text>  7) If the number of candidate single-slot resources or candidate multi-slots resources remaining in the set is smaller than , then [ and , if set, ] is increased by 3 dB for each priority value and the procedure continues with step 4. | | (1) Agree, revised accordingly  (2) Agreed, revised accordingly with minor edits.   1. Agree, Captured as suggested with some slight rewording.   Comment #2:  Agree, needs to be added |
| Huawei, HiSilicon\_2 | **Comments for SL-U PHY channel design**  Comment 1:  Suggest following red changes, details are:   * Need to reflect “contiguous interlace” as per agreement. * It seems the mapping details in agreement (copied below) is not captured yet.   + *“Option 2: sub-channel#0 is mapped to K interlace(s) starting from interlace#0”*   + *“sub-channel#1 is mapped to K interlace(s) starting from interlace#K, and so on”* * Add “…and the UE uses both of these two RB sets for PSSCH transmission” to align with agreement and be accurate.   ==  In the frequency domain,  - If the higher layer parameter *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 *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, in the frequency domain, a sidelink resource pool consists of sl-NumSubchannel sub-channels, where each sub-channel consists of *numInterlacePerSubchannel* contiguous interlace(s) and *numInterlacePerSubchannel* is ~~given by the~~ higher layer parameter ~~numInterlacePerSubchannel interlaces~~.   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. A UE can be configured with intra-cell guard bands according to the higher layer parameter *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, , a UE has successfully performed channel access procedure in both adjacent RB sets and the UE uses both of these two RB sets for PSSCH transmission.  **Agreement**  For interlace RB-based PSCCH/PSSCH transmission in SL-U, regarding details of mapping between sub-channel and interlace:   * In a resource pool with multiple RB sets, sub-channel with the same index is mapped to K interlace(s) with the same index(s) in different RB sets. * In a resource pool, support the following   + At least for the agreed case where one SL resource pool can be (pre-)configured to include integer number of RB sets     - Option 2: sub-channel#0 is mapped toK interlace(s) starting from interlace#0       * sub-channel#1 is mapped toK interlace(s) starting from interlace#K, and so on       * At least support that the above K interlace(s) are contiguous         + FFS: whether/how to support the above K interlace(s) are non-contiguous   + FFS: if RAN1 agrees to support that one SL resource pool can be (pre-)configured to include sub-set of PRBs of one RB set, the mapping between sub-channel and interlace for this case will be further discussed * Interlace is indexed as per NR-U   **Agreement**  Regarding usage of PRBs within intra-cell guard band of two adjacent RB sets:   * Such PRBs can be used for PSSCH transmission if and only if a UE can transmit on the respective LBT channels after performing channel access procedure in multi-channel case and the UE uses both of these two RB sets for PSSCH transmission   + FFS details, e.g., handling of potential unequal sub-channel size, for interlaced RB based transmission, whether the PRB(s) in the intra-cell guard band have the same interlace index(s) as the PRBs for PSSCH transmission in these two RB sets * Such PRBs are not used for PSCCH transmission   + FFS: whether or not such PRBs are used for PSFCH/S-SSB transmission   Comment 2:  Suggest following red changes, details are:   * Need to reflect “contiguous interlace” as per agreement.   ==  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 *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 *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]. The lowest RB in the resource pool is given by the higher layer parameter *startRBResourcePool*. 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.  Comment 3:  Suggest following red changes, details are:   * So far, these new fields are only in SCI 2-A, need to remove those in SCI 2-B, 2-C   ==  The UE shall set the contents of the SCI formats 2-B as follows:  - the UE shall set value of the '*HARQ process number*' field as indicated by higher layers.  - the UE shall set value of the '*NDI*' field as indicated by higher layers.  - the UE shall set value of the '*Redundancy version*' field as indicated by higher layers.  - the UE shall set value of the '*Source ID*' field as indicated by higher layers.  - the UE shall set value of the '*Destination ID*' field as indicated by higher layers.  - the UE shall set value of the '*HARQ feedback enabled/disabled indicator*' field as indicated by higher layers.  - the UE shall set value of the '*Zone ID*' field as indicated by higher layers.  - the UE shall set the '*Communication range requirement*' field as indicated by higher layers.  ~~- the UE shall set value of the ‘~~*~~CAPC~~*~~’ field as indicated by higher layers.~~  ~~- the UE shall set value of the ‘~~*~~Additional ID’~~* ~~field as indicated by higher layers.~~  ~~- the UE shall set value of the ‘~~*~~Remaining COT duration’~~* ~~field as indicated by higher layers.~~  The UE shall set the contents of the SCI format 2-C as follows:  - the UE shall set value of the *'HARQ process number'* field as indicated by higher layers.  - the UE shall set value of the '*NDI*' field as indicated by higher layers.  - the UE shall set value of the '*Redundancy version*' field as indicated by higher layers.  - the UE shall set value of the '*Source ID*' field as indicated by higher layers.  - the UE shall set value of the '*Destination ID*' field as indicated by higher layers.  - the UE shall set value of the '*HARQ feedback enabled/disabled indicator*' field as indicated by higher layers.  - the UE shall set value of the '*CSI request*' field as indicated by higher layers.  ~~- the UE shall set value of the ‘~~*~~CAPC~~*~~’ field as indicated by higher layers.~~  ~~- the UE shall set value of the ‘~~*~~Additional ID’~~* ~~field as indicated by higher layers.~~  ~~- the UE shall set value of the ‘~~*~~Remaining COT duration’~~* ~~field as indicated by higher layers.~~  - the UE shall set value of '*Providing/Requesting indicator*' field as indicated by higher layers.  Comment 3:  Suggest following red changes, details are:   * Need to remove “~~at maximum~~”: since there are always 2 in this case. * This is SL-BWP level. * “PSSCH resource allocation starts at the next symbol after each candidate starting symbol.”: this is need and similar to legacy sentence.   ==  - Within the slot, PSSCH resource allocation starts at symbol *sl-StartSymbol+1,* except when *startingSymbolFirst* and *startingSymbolSecond* are provided for the sidelink resource pool*.* If *startingSymbolFirst* and *startingSymbolSecond* are provided for a ~~sidelink resource pool~~ SL-BWP, there are ~~at maximum~~ 2 candidate starting symbols for PSSCH transmission for slots without PSFCH symbols.*.* PSSCH resource allocation starts at the next symbol after each candidate starting symbol.  Comment 4:  Add following “i.e.,” part to avoid any confusion.  ==  - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *startingSymbolFirst* and *startingSymbolSecond* are provided for a sidelink resource pool, the number of sidelink symbols assumed in transport block size determination is determined by a reference number of symbols, *numRefSymbolLength*, provided by higher layers, i.e., = *numRefSymbolLength* -2.  **Agreement**  If a resource pool includes slots with 2 candidate starting symbols for a PSCCH/PSSCH transmission, for TBS determination and 2nd SCI overhead, in TS 38.214 Clause 8.1.3.2:   * *L\_ref* replaces *sl-LengthSymbols*   + Value range of *L\_ref* is {7, 8, 9, 10, 11, 12, 13, 14} symbols * is determined in the same way as in legacy NR SL   Comment 5:  Suggest following red changes, details are:   * Re-place some sentences.   + MAC may not provide *rbSetsWithConsecutiveLBTFailure* every time resource selection is triggered. E.g., RAN2 may agree that once *rbSetsWithConsecutiveLBTFailure* is provided, it remains valid until another new list is provided, so there is no need to provide it every time resource selection is triggered. So this part needs to be re-placed. * Updated some wording to align with RAN2’s LS   ==  - the remaining packet delay budget;  ~~- 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.  - the number of sub-channels to be used for the PSSCH/PSCCH transmission in a slot, ;   * + 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.   - optionally, the resource reservation interval, , in units of msec.  - if the higher layer requests the UE to determine a subset of resources from which the higher layer will select resources for PSSCH/PSCCH transmission as part of re-evaluation or pre-emption procedure, the higher layer provides a set of resources which may be subject to re-evaluation and a set of resources which may be subject to pre-emption.  - it is up to UE implementation to determine the subset of resources as requested by higher layers before or after the slot - , where is the slot with the smallest slot index among and , and is equal to , whereis defined in slots in Table 8.1.4-2 whereis the SCS configuration of the SL BWP.  - Optionally, the indication of resource selection mechanism.  ~~-~~ *~~rbSetsWithConsecutiveLBTFailure~~*~~, which indicates the RB sets where consecutive LBT failure has been indicated.~~  The following higher layer parameters affect this procedure:  *- …*  - Optionally, indication of whether UE is required to perform SL reception of PSCCH and RSRP measurement for partial sensing on slots in SL DRX inactive time as *sl-PartialSensingInactiveTime.*  - Optionally, *rbSetsWithConsecutiveLBTFailure*, which indicates the RB sets where consistent LBT failure has been detected.  ==  RAN2’s LS R1-2306174  RAN2 discussed mode 2 resource (re)selection due to the detection of consistent LBT (C-LBT) failure on an RB set, and made the following agreements:   * MAC informs PHY of the RB set information where SL C-LBT failure was detected. * During resource (re)selection, PHY excludes the resources for the RB set where C-LBT failure was detected.   Comment 6:  Suggest following red changes, details are:   * “~~of a RB set~~” seems unnecessary, and can be removed.   ==  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', the UE shall exclude candidate single-slot resource, whose lowest sub-channel ~~of a RB set~~ includes resource blocks of the intra-cell guardband PRBs, configured by higher layer parameter, *intraCellGuardBandsSL-List*.  Comment 7:  Suggest following red changes, details are:   * “If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, …” is needed since the following only applies to IRB case. * It seems the following in agreement is not captured yet. * *“Frequency domain resource of PSSCH transmission is determined by an intersection of the resource blocks of 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 *sl-MaxNumPerReserve* is 2 then    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 [ABCDE]. The number of contiguously allocated RB sets for each of the N RB sets 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   **Agreement**  Regarding frequency domain resource indication for interlace RB-based PSSCH transmission, support the followings:   * Option A: Support that for one PSSCH transmission, the used interlace index(s) in different used RB sets are always the same * Option 1: Support explicitly indicating the used sub-channel index(s) and RB set index(s)   + Frequency domain resource of PSSCH transmission is determined by an intersection of the resource blocks of 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   + For a TB, the initial transmission and reservation of the resource(s) for retransmission(s) use the same number of sub-channel(s) and same number of RB set(s)     - FFS: whether additionally support different number of RB set(s) in such case while keeping total number of sub-channels unchanged between initial transmission and retransmission(s) for a TB   + … | Comment 1: seems ok.  Comment 2:  Agree  Comment 3:  This can be aligned when the related discussion for 38.212 has concluded.  Comment 3:  Ok to remove “at maximum”  SL-BWP level is ok  Need to check the 3rd change  Some clarification may be needed  Comment 5:  To be checked  Comment 6:  Need to double check, probably ok to remove  Comment 7:  The change seems ok.  Need to check if and how to capture the resource allocation aspects. |
| OPPO | Many thanks to editor’s effort in preparing the draft CR!  **Comment 1:**  The additional candidate S-SSB occasions should not be included in the resource pool, such feature is not captured.  **Working assumption**  Additional candidate S-SSB occasions are excluded from resource pool  **Comment 2:**  If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, the sub-channel m for m=0,1,⋯,numSubchannel-1 consists of a set of numInterlacePerSubchannel interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211]. The lowest RB in the resource pool is given by the higher layer parameter *startRBResourcePool*. 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.  Current CR only describes one sub-channel includes a set of interlaces, but it does not restrict the index of interlaces in one subchannel is contiguous (as can be seen in the yellow highlighted part of the agreements below).  **Agreement**  For interlace RB-based PSCCH/PSSCH transmission in SL-U, regarding details of mapping between sub-channel and interlace:   * In a resource pool with multiple RB sets, sub-channel with the same index is mapped to K interlace(s) with the same index(s) in different RB sets. * In a resource pool, support the following   + At least for the agreed case where one SL resource pool can be (pre-)configured to include integer number of RB sets     - Option 2: sub-channel#0 is mapped toK interlace(s) starting from interlace#0       * sub-channel#1 is mapped toK interlace(s) starting from interlace#K, and so on       * At least support that the above K interlace(s) are contiguous         + FFS: whether/how to support the above K interlace(s) are non-contiguous   + FFS: if RAN1 agrees to support that one SL resource pool can be (pre-)configured to include sub-set of PRBs of one RB set, the mapping between sub-channel and interlace for this case will be further discussed * Interlace is indexed as per NR-U   **Comment 3:**  On the SCI fields for COT-SI: CAPC, Additional ID and Remaining COT duration,   1. There is a missing field “COT sharing cast type”, which is already captured by the 38.212 editor. This is already in the agreement and should be also captured in 38.214. 2. Parameter name for Additional ID is captured in 38.212 as “COT sharing additional ID”. This name can be also used here in 38.214. 3. Currently the 38.212 editor only captured these fields in SCI format 2-A. In our view, these fields are also applicable for format 2B and 2C. But this point is still under discussion with the 38.212 editor. For now, these fields can be in squared brackets in format 2B and 2C in 38.214, until this issue is resolved.   **Comment 4:**  On the transmission of CPE for PSCCH/PSSCH, RAN1 has the follow four main agreements and they should be captured in 38.214. Basically, there are two branches / scenarios according to Agreement (1) below.   * CPE when initiating a COT (outside COT case) is associated with a set of one or more candidate CPE starting position(s) * CPE for within a COT (inside COT case) is associated with a separate set of one or more candidate CPE starting position(s) * The UE behaviours for the COT initiating case according to Agreement (2) below are not fully captured. * Similarly, the UE behaviours for the within a COT case according to Working Assumption (3) below are not captured.   **Agreement (1)**  **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 (2)**  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   **Working assumption (3)**  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 (4)**  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.**  **Comment 5:**  As we commented in the last meeting, it is a common understanding that should also be increased when X\*Mtotal resources cannot be achieved. Otherwise, it will cause the issue of infinite loop. We suggest to remove the bracket in step 7.  **Comment 6:**  On resource selection for MCSt, the following agreement and Working assumption (yellow highlights) should be captured in Section 8.1.4.  **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   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.   **Comment 7:**  We should add “optionally” at the beginning of the following sentence, since C-LBT may not always declared.  - Optionally, *rbSetsWithConsecutiveLBTFailure*, which indicates the RB sets where consecutive LBT failure has been indicated.  **Comment 8:**  Based on the following agreement, a resource exclusion behaviour should be described in Section 8.1.4. Currently, the editor has captured this behaviour in Step 1), which in our view is not correct / inappropriate, since the candidate resource set *SA* is not initialized until Step 4). There are several ways to implement this resource exclusion, e.g., in Step 4) during the initiation, in Step 5) during the hard exclusion, or in Step 7) just before the reporting. RAN1 should further discuss in the next meeting on exactly how to implement this, as this exclusion also has impact to the Mtotal calculation and the X\*Mtotal criterion in Step 7).  For now, we can put the following sentence in the square brackets in the draft CR and come back to the spec once we have resolved this issue in the next RAN1 meeting.  [If *rbSetsWithConsecutiveLBTFailure* is provided, the UE shall exclude candidate single-slot resources, whose associated RB sets is included in the *rbSetsWithConsecutiveLBTFailure* parameter.]  For the same reasons, the following sentence should be also in the square brackets.  [If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', the UE shall exclude candidate single-slot resource, whose lowest sub-channel of a RB set includes resource blocks of the intra-cell guardband PRBs, configured by higher layer parameter, *intraCellGuardBandsSL-List*.]  **Agreement**  Regarding frequency domain resource indication for interlace RB-based PSSCH transmission:   * Alt A: MAC layer indicates both and to PHY layer, where is the number of used RB sets for one PSCCH/PSSCH transmission   + Regarding in TS 38.214 Clause 8.1.4, down-select one of the followings in RAN1#114:     - Sub-Alt 1: is “the number of sub-channels within each RB set to be used for the PSSCH/PSCCH transmission in a slot”       * Note:     - Note: is the number of used sub-channels within each RB set for one PSCCH/PSSCH transmission * Resources from the RB set where C-LBT failure was detected are not reported to MAC layer. * Note: RAN1 assumes “*MAC informs PHY of the RB set information where SL C-LBT failure was detected*” as per RAN2’s LS in R1-2306174 | Comment 1:  To be checked  Comment 2:  Agree, corrected.  Comment 3:  Agree, will be aligned with 38.212  Comment 4:  Agree, has been updated.  Comment 5:  ??  Comment 6:  Probably ok, but not sure how to capture this…  Comment 7:  Need to double check.  Comment 8:  ??? |
| Samsung | Comment 1: Additional S-SSB transmission occasion excluded from resource pool is not captured in current specification yet. According to draft CR 38.213, additional S-SSB transmission occasions are separately defined from legacy S-SSB slots (as per RAN1 agreement), so we expect corresponding change as follow in 38.214.  The set of slots that may belong to a sidelink resource pool is denoted by where  -  - the slot index is relative to slot#0 of the radio frame corresponding to SFN 0 of the serving cell or DFN 0,  - the set includes all the slots except the following slots,  - slots in which S-SS/PSBCH block (S-SSB) or additional transmission occasion for S-SSB is configured,  Comment 2: We believe further RAN1 clarification is needed on using the parameter sl-NumSubchannel for SL-U, whether it’s defined per RB-set or per resource pool. We saw different companies’ views are not aligned here.  Comment 3: The fields in SCI format can be aligned with drat CR 38.212: “CAPC”, “COT sharing cast type”, “COT sharing additional ID”, and “Remaining COT duration”. | Comment 1:  Agree, captured as suggested  Comment 2:  We are open to more discussion on this in case there is ambiguity.  Comment 3:  Agree, will be aligned with 38.212. |
| QC | We thank the editor for preparing the draft CR. In what follows we provide some comments and suggestions for changes.  **QC Comment #1:**  For CPE selection (8.1.2.1), We echo the comments from other companies (e.g. OPPO’s Comment 4): RAN 1 #113 has agreed on a protocol that switch between Scheme 1 and Scheme 2 based on the slot for SL transmission being reserved. This was agreed for initiate transmissions (outside COT) in RAN1 #113, and has been agreed to be used even within a COT (e.g., COT sharing from another UE, or resuming transmissions for a second SL transmission burst from the initiator) in RAN1 #114. L1 SL priority has been selected in RAN1 #114 for determining the CPE when the default is not used (relevant agreements have been reported by OPPO in Comment 4).  We believe that this should be captured by a more extensive description. In practice the framework for CPE selection is the same in the case of initial SL transmission after a Type 1 access (first SL TX burst of the COT initiating UE), and initial transmission after Type 2 access (initiating UE starts a second SL burst after stop/resume, or another UE shares the COT), the only difference is that another pre-configured set is used (Inside-COT or outside-COT set).  In the following some sample text for the editor’s consideration:  “  - For operation with shared spectrum channel access in frequency range 1, for the first ~~UL~~ SL transmission to initiate a channel occupancy in a slot the UE determines a duration of a cyclic prefix extension Text to be applied according to [4, TS 38.211] where the index for Δ\_i [4, TS 38.211] is chosen as follows:   * If a resource reservation is transmitted or resource reservations is detected for the slot and the RB set(s) of the intended PSSCH transmission, [the UE selects the (pre-)configured default CPE starting position from a set of values configured by the higher layer parameter CPEStartingPositionsPSCCH-PSSCH-~~Initiate~~OutsideCOT] * Otherwise, the UE selects randomly from a set of values configured by the higher layer parameter CPEStartingPositionsPSCCH-PSSCH-~~Initiate~~OutsideCOT among the values associated to the same L1 priority of the PSSCH.]   - For operation with shared spectrum channel access in frequency range 1, for the first ~~UL~~ SL transmission to initiate a SL transmission burst within a channel occupancy in a slot the UE determines a duration of a cyclic prefix extension Text to be applied according to [4, TS 38.211] where the index for Δ\_i [4, TS 38.211] is chosen as follows:   * If a resource reservation is transmitted or resource reservations is detected for the slot and the RB set(s) of the intended PSSCH transmission, [the UE selects the (pre-)configured default CPE starting position from a set of values configured by the higher layer parameter CPEStartingPositionsPSCCH-PSSCH-~~Initiate~~InsideCOT] * Otherwise, the UE selects randomly from a set of values configured by the higher layer parameter CPEStartingPositionsPSCCH-PSSCH-~~Initiate~~InsideCOT among the values associated to the same L1 priority of the PSSCH.]   ”  **QC Comment #2:**  In RAN1 #114 agreements on MCSt have been made and should be captured in section 8.1.4 (echo OPPO’s Comment 6). | Comment 1:  Agree, see the harmonized text in the updated draft.  Comment 2:  Agree |
| Sharp | * **Comment #1, on 8:**   Add “the UE” that performs channel access procedure for clarity.   |  | | --- | | 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. A UE can be configured with intra-cell guard bands according to the higher layer parameter *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. |  * **Comment #2, on 8.1.2.1:**   Typo.   |  | | --- | | - For operation with shared spectrum channel access in frequency range 1, for the first SL transmission to initiate a channel occupancy the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen randomly from a set of values configured by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT*. |  * **Comment #3, on 8.1.2.1:**  |  | | --- | | **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  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. |   According to above agreements, scheme 2 is applied when resource reservations is detected. Otherwise, scheme 1 is applied. To reflect the agreements (above yellow highlight), the followings are proposed.   |  | | --- | | - For operation with shared spectrum channel access in frequency range 1, for the first UL transmission to initiate a channel occupancy the UE determines a duration of a cyclic prefix extension *Text* to be applied according to [4, TS 38.211] where the index for [4, TS 38.211] is chosen randomly from a set of values configured by the higher layer parameter *CPEStartingPositionsPSCCH-PSSCH-InitiateCOT* for associated L1 priority of the intended PSCCH/PSSCH transmission if a resource reservation is transmitted or resource reservations is detected for a slot and RB set(s) of the intended PSCCH/PSSCH transmission, or is chosen from a default value otherwise. |  * **Comment #4, on 8.1.4:**   Regarding the last but two paragraph of Step 1), an example on why “of a RB set” should be removed: if a candidate resource corresponds to sub-channels in two consecutive RB sets, and if only the lowest sub-channel of the 2nd RB set includes GB PRBs, this candidate resource should not be excluded.   |  | | --- | | If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘contiguousRB', the UE shall exclude candidate single-slot resources with the lowest sub-channel includeing resource block(s) of the intra-cell guardband PRBs, configured by higher layer parameter, *intraCellGuardBandsSL-List*. |  * **Comment #5, on 8.1.4:**   Regarding the last but one paragraph of Step 1), none of the RB sets of a candidate resource should be within those with C-BLT.   |  | | --- | | If *rbSetsWithConsecutiveLBTFailure* is provided, the UE shall exclude candidate single-slot resources with one or more associated RB sets included in the *rbSetsWithConsecutiveLBTFailure* parameter. |  * **Comment #6, on 8.1.4:**   Regarding the last paragraph of Step 1), now with exclusion of some candidate resources in Step 1), it is unclear what “the total number of candidate single-slot resources” actually means.   |  | | --- | | The total number of remaining candidate single-slot resources is denoted by . |  * **Comment #7, on 8.1.4:**   The agreement about that the higher layer can indicate the number of consecutive slots for MCSt to the physical layer has not been captured.   |  | | --- | | 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 |   Therefore, the following is proposed to capture the parameter provided by the higher layer.   |  | | --- | | - Optionally, the indication of resource selection mechanism.  - *rbSetsWithConsecutiveLBTFailure*, which indicates the RB sets where consecutive LBT failure has been indicated.  - , which indicates the number of consecutive slots for MCSt. |  * **Comment #8, on 8.1.4:**   The following agreement regarding how to define candidate multi-slots resource has not been captured in the step 1 in resource selection procedure for Mode 2.   |  | | --- | | 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. |  * **Comment #9, on 8.1.5:**   “N RB sets” should be the “N resources”. In addition, the number of contiguously allocated RB sets LRBset can be equal to 1. Therefore, following corrections are proposed.   |  | | --- | | The starting RB set of the first resource is determined according to the clause [ABCDE]. The number of contiguously allocated RB sets for each of the N resources 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. | | Comment 1:  Agree, updated accordingly  Comment 2:  Agree, updated accordingly  Comment 3:  Agree, see the harmonized text in the updated draft  Comment 4:  To be checked  Comment 5:  To be checked  Comment 6:  OK (?)  Comment 7:  Seems ok, but need to check  Comment #8:  Seems ok, but need to check |
| Huawei, HiSilicon\_3 | **Comments for Coexistence**  Although RAN1 did not have new agreement for coexistence in August meeting, it would be great RAN1 can handle remaining issues during the spec CR phase together in order to have a more completed and cleaner spec for September RAN plenary.  **Comment #1 for timing**   1. The ‘LTE sensing window’ is already defined in 36.213, introducing a new LTE sensing window might lead ambiguity for UE transmit an LTE PSSCH in sharing resource pool. Thus, we suggest to use time range instead. In addition, the LTE subframe is not defined in previous agreements (in red). In NR SL spec, it is better to keep aligned by using NR time slots, so we suggest to convert into the corresponding NR SL slot n. 2. Additionally, ‘T\_valid2 = T + 4’ and meaning of T (in blue) are not specified in this step. This point is not a critical issue, but we prefer to align with the agreement.  |  | | --- | | **Agreement**  The NR SL module uses the information from the starting LTE SL subframe to the ending LTE SL subframe in the shared information from the LTE SL module.   * The starting LTE SL subframe is no later than the time (n-T\_start)   + n is the time where NR SL module triggers its NR SL resource (re)selection procedure as defined in clause 8.1.4 of TS 38.214     - Option 1-2: T\_start is 1100ms * The ending LTE SL subframe is n-T\_valid2. Up to UE implementation to additionally use results from subframe(s) later than n-T\_valid2.   + T\_valid2 = T + 4 ms   **Agreement**  For dynamic resource pool sharing, the NR SL module is expected to use the information shared by the LTE SL module to the NR SL module which is known by NR SL module at the latest T ms prior to slot n (as defined in clause 8.1.4 of TS 38.214), to determine a set of resources for its own (re)transmission.   * T is defined using   + T≤Tmax ms, and is based on UE implementation, according to the Rel-16 NR SL timeline for in-device coexistence.     - FFS: Value of Tmax * FFS: any discussion on the earliest information, if needed   **Agreement**   * Based on the Agreement in RAN1#110bis-e, the value of Tmax = 4 ms. |   **Suggested changes:**   |  | | --- | | #TS 38.214 Clause 8.1.4#  2LTE) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: UE derives the LTE reservation information within the range [] where ~~The [LTE sensing window is defined by] the range of LTE subframes  [~~~~], where is the LTE subframe in which this procedure is triggered and which overlaps slot~~ *~~n~~*~~,~~   is 1100 msec and is up to UE implementation under ; is 4+T msec, where T ≤ 4 msec and is based on UE implementation. The UE shall perform the procedures in 5LTE3 and 6LTE based on PSCCH decoded results and RSRP measured results ~~in these LTE subframes~~ within the range. |   **Comment #2 for non-monitored slot/subframe**  **Reason for changes**:  1) To align with following wording, clarify that ‘LTE resource pool’ in step 5LTE1) is ‘LTE sidelink resource pool’.  2) According to previous discussion in RAN1, non-monitored slots are common to both LTE SL module and NR SL module, thus ‘slot ’ in step5 should be reused in step 5LTE1).   |  | | --- | | #TS 38.214 Clause 8.1.4#  For dynamic co-channel coexistence of LTE sidelink and NR sidelink, denotes the set of subframes that may belong to an LTE sidelink resource pool as defined in clause 14.1.5 of [19, TS36.213].  The following steps are used: |   **Suggested changes:**   |  | | --- | | #TS 38.214 Clause 8.1.4#  5LTE1) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The UE shall exclude any candidate single-slot resource from the set if all the following conditions are met:  -    the resource pool overlaps with an LTE sidelink resource pool;  -    the UE has not monitored ~~an LTE subframe  overlapping with~~ slot .  -    for any periodicity value allowed by the LTE higher layer parameter *restrictResourceReservationPeriod* and a hypothetical LTE SCI format 1 ~~received~~ derived in ~~LTE subframe~~ slot with '*Resource reservation’* field set to that periodicity value and indicating all subchannels of the LTE sidelink resource pool in this LTE subframe, condition c in step 6LTE would be met. |   **Comment #3 for resource to be used by in-device LTE SL module**  **Reason for changes**:  The ‘selected sidelink grant’ is not a RAN1 wording. Instead, in PHY, UE can know whether the resource is determined or not for an LTE SL transmisison.   |  | | --- | | **Agreement**  In NR SL resource (re)selection procedure for dynamic resource pool sharing, the PHY layer of NR SL module excludes NR SL candidate resources in a NR SL slot overlapping with LTE SL resources selected to be used for LTE SL module’s own LTE SL transmission  …   * The PHY layer of NR SL module applies the above procedure in Step 5 in Section 8.1.4 of TS 38.214   + Note: For periodic resource reservation of NR SL transmission, the PHY layer of NR SL module further excludes all NR SL candidate resources in a NR SL slot where NR SL periodic resources are in the NR SL slot overlapping with LTE SL resources selected to be used for LTE SL module’s own LTE SL transmission according to Step 5 in Section 8.1.4 of TS 38.214   …   * + - Note: It is assumed that the information relevant to LTE SL resources selected to be used for LTE SL module’s own LTE SL transmission used in the above procedure is shared from LTE SL module to NR SL module |   **Suggested changes:**   |  | | --- | | #TS 38.214 Clause 8.1.4#  5LTE2) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The UE shall exclude any candidate single-slot resource from the set if all the following conditions are met:  -    the set of LTE resource blocks and LTE subframes to be used by own LTE V2X transmissions have been determined ~~has a selected sidelink grant for LTE V2X according to [19, TS 36.321]~~.  -    ~~the selected sidelink grant for LTE V2X determines~~ the set of LTE resource blocks and LTE subframes which overlaps in time with for *j=*0, 1, …, ;  -    the priority value associated with the ~~selected sidelink grant for~~ LTE V2X transmission is lower than ; It is up to UE implementation whether or not to apply this exclusion step if the priority value associated with ~~selected sidelink grant for~~ LTE V2X transmission is higher than or equal to . |   **Comment #4 for PSFCH handling**  **Reason for changes**:   1. Similar to ‘non-motored slot’ issue, slot instead of subframe should be used (in red). 2. PSSCH-RSRP result is shared from LTE SL module instead of measured by NR SL module itself (in green). Additionally, I used the wording ‘LTE SCI is received’ instead of ‘the UE receives LTE SCI’ to avoid the misunderstanding that NR SL module receives LTE SCI.   **Suggested changes**:   |  | | --- | | #TS 38.214 Clause 8.1.4#  5LTE3) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The UE shall exclude any candidate single-slot resource from the set if all the following conditions are met:  a)  the resource pool is configured with PSFCH resources;  b)  ~~the UE receives~~ an LTE SCI format 1 is received in LTE subframe overlapping with slot , and following reservation information derived from the LTE SCI format 1: ~~and~~ the '*Resource reservation'* field and '*Priority*' field in ~~the received~~ LTE SCI format 1 indicate the values and , respectively according to Clause 14.2.1 in [19, TS 36.213], where LTE subframes are indexed according to Clause 14.1.5 in [19, TS 36.213], and LTE PSSCH-RSRP measurement associated with LTE SCI format 1;  c)  the LTE PSSCH-RSRP measurement associated with ~~according to the received~~ LTE SCI format 1 is higher than  d) the set of LTE subframes derived in ~~the SCI format received in LTE subframe~~slot or to be derived in ~~the same SCI format which is assumed to be received in LTE subframe(s)~~ slot ~~determines according to clause 14.1.1.4C or clause 14.2.4 in [19, TS 36.213] the set of LTE subframes~~ which overlaps with PSFCH slots associated with for *q*=1, 2, …, *Q* and *j=*0, 1, …, where the PSFCH association is according to [6, TS 38.213]. and *Q* are determined as in condition c) of step 6LTE. |   **Comment #5 for resource reserved by other LTE SL UEs**  **Reason for changes**:   1. Information associated with LTE SCI is shared from LTE SL module instead of decoded by NR SL module. So, a sentence is added. 2. Similar to previous steps, slot instead of subframe should be used, and slot n instead of subframe should be used. 3. 3) Time and frequency resources reserved by LTE SL is also derived from LTE SCI. so, a sentence is added in condition a). Otherwise, the LTE resource blocks and LTE subframes in condition c) seems being decoded by NR SL module. 4. ‘According to’ is modified to ‘associated with’ to align with following agreement. 5. Logical period of LTE SL is used in step 6LTE). However it refers to different number of logical slot when different SCS is configured to NR SL. For example, P=100ms in SCI refers to about 100 logical slots in 15kHz but about 200 logical slots in 30kHz. The current wording in spec is inaccurate.  |  | | --- | | **Agreement**  In NR SL resource (re)selection procedure, option 1 is adopted for how to determine candidate resource set for NR SL considering the LTE SL reserved resources by other LTE SL UE   * Option 1: The PHY layer of NR SL module excludes NR SL candidate resources overlapping with LTE SL reserved resources by other LTE SL UE when the SL RSRP value associated with the LTE SL reserved resources is higher than a SL RSRP threshold, where the SL RSRP threshold is derived based on LTE SL priority of other LTE SL UE and NR SL priority for NR SL transmission * …   + Note: It is assumed that the information relevant to LTE SL reserved resources by other LTE SL UE used in the above procedure is shared from LTE SL module to NR SL module |   **Suggested changes**:   |  | | --- | | 6LTE) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The UE shall exclude any candidate single-slot resource from the set if all the following conditions are met:  a) the UE receives an LTE SCI format 1 in LTE subframe overlapping with slot , and and following reservation information is derived from the LTE SCI format 1:the '*Resource reservation'* field and '*Priority*' field in the received LTE SCI format 1 indicate the values and , respectively according to Clause 14.2.1 in [19, TS 36.213], where LTE subframes are indexed according to Clause 14.1.5 in [19, TS 36.213], the set of LTE resource blocks and LTE subframes, and LTE PSSCH-RSRP measurement associated with LTE SCI format 1;  b) the LTE PSSCH-RSRP measurement associated with ~~according to the received~~ LTE SCI format 1 is higher than  c) the set of LTE resource blocks and LTE subframes derived in ~~the SCI format received in LTE subframe~~ or to be derived in slot   , ~~the same SCI format which is assumed to be received in LTE subframe(s) determines according to clause 14.1.1.4C or clause 14.2.4 in [19, TS 36.213] the set of LTE resource blocks and LTE subframes~~ which overlaps with for *q*=1, 2, …, *Q* and *j=*0, 1, …, . Here, is with determined according to Table 14.1.1-1 in [19, TS 36.213], if and , where ~~if subframe belongs to the set , otherwise subframe is the first subframe after subframe belonging to the set ;~~  if slot *n* belongs to the set , otherwise slot is the first slot after slot *n* belonging to the set ; Otherwise . is set to selection window size *T2* converted to units of msec. |   **Comment #6 for RSRP boosting**  **Reason for changes**:  No agreement was reached to raise the RSRP threshold for LTE SL reservation in step7, thus the following in bracket should be deleted.  **Suggested changes**:   |  | | --- | | #TS 38.214 Clause 8.1.4#  7)  If the number of candidate single-slot resources remaining in the set is smaller than , then ~~[ and , if set, ]~~ is increased by 3 dB for each priority value and the procedure continues with step 4. | | #1-1 Please see response to ZTE #4.  #1-2 OK to discuss further, but does the proposed change actually have any effect? The bound on T\_end does not seem to change.  #2-1: Agree  #2-2 As LTE sidelink operates in subframes the current wording looks valid and better aligned with legacy LTE SL behaviour.  #3 Disagree: “selected sidelink grant” has been used. in the RAN1 specs TS 38.214 and TS 38.215 since Rel-16. It is well-defined in TS 38.321.  #4-1 Same as for #2-2  #4-2 OK to use passive voice “LTE SCI is received” to avoid any misunderstanding that the NR SL module needs to directly receive it (2 instances). Regarding PSSCH-RSRP, the current wording does not imply that this measurement is performed by the NR SL module, and changing “according to” to “associated with” does not seem to make any difference in that regard.  #5-1 “UE receives an LTE SCI format 1” already changed to passive voice according to previous comment. Current wording does not imply that NR SL module performs the decoding and the proposed change does not seem to make any difference in that regard  #5-2 as for previous comment  #5-3 As for #5-1  #5-4 Wording seems equivalent  #5-5 Current text operates in number of LTE subframes, not number of NR slots, so this looks like another reason to keep the description in terms of LTE subframes.  #6 This was controversial after RAN1#113, Prefer to discuss this in the next meeting. |
| Xiaomi | We share similar view with LG. The following agreements about MCSt shall be captured in clause 8.1.4.  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 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 | Agree, will be captured |
| Huawei, HiSilicon\_4 | **Comments for SL-U PHY channel design**  Comment 1:   * It seems the rule to use 2nd candidate starting symbols in agreement (blue part) is not captured yet. Suggest to add following red sentence. * “*startingSymbolFirst* and *startingSymbolSecond*” are per SL-BWP level, suggest to update as “for ~~a sidelink resource pool~~ the SL-BWP”.   ==  Within the slot, PSSCH resource allocation starts at symbol *sl-StartSymbol+1,* except when *startingSymbolFirst* and *startingSymbolSecond* are provided for the sidelink resource pool*.* If *startingSymbolFirst* and *startingSymbolSecond* are provided for ~~a sidelink resource pool~~ the SL-BWP, there are at maximum 2 candidate starting symbols for PSSCH transmission for slots without PSFCH symbols. In the same slot, Tx UE can use the 2nd starting symbol, provided by *startingSymbolSecond,* only if LBT fails at the 1st starting symbol, provided by *startingSymbolFirst.*  **Agreement**  Regarding Tx UE behavior, at least when it initiates a COT:   * For the 1st slot of a COT, the Tx UE chooses the earliest starting symbol for PSCCH/PSSCH transmission after clearing LBT.   + Note: in the same slot, Tx UE can use the 2nd starting symbol only if LBT fails at the 1st starting symbol * FFS: whether/how to support that for the remaining slots of a COT, the Tx UE only chooses the 1st starting symbol for PSCCH/PSSCH transmission.   + FFS applicable scenarios     - e.g., at least for MCSt with no greater than 16us gap     - e.g., at least for transmission with no greater than 16us gap from the previous transmission by any UE   + FFS: Rx UE behavior   Comment 2:  Suggest to add following red parts to avoid any confusion.  ==  - 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 *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, a reference number of PRBs (*nref)* per interlace within 1 RB set, *numRefPRBOfInterlace*, is provided by higher layers for determination of total number of PRBs for PSSCH, i.e., *nPRB = nref \* ninter,subCH \* nsubCH \* nRB-set, where ninter,subCH is given by the higher layer parameter numInterlacePerSubchanne, 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*. | Agree, will be added. Some rewording needed. |
| DCM | Thank you for the CR.  We share similar view with companies in terms of some points.   * MCSt should be captured, i.e., resource identification with multi-slot resource based on higher layer indication should be specified in 8.1.4. * Old definition of L\_subCH seems to be unnecessary. * CPE duration determination for other cases should also be captured in this spec.   Besides, we believe it is better to update the following.   * “If startingSymbolFirst and startingSymbolSecond are provided for a sidelink resource pool, the number of sidelink symbols assumed in transport block size determination is determined by a reference number of symbols, numRefSymbolLength, provided by higher layers.” is a bit unclear. Which value is finally used for should be clarified. * “If the higher layer parameter transmissionStructureForPSCCHandPSSCH is set to ‘interlaceRB’, a reference number of PRBs per interlace within 1 RB set, numRefPRBOfInterlace, is provided by higher layers for determination of total number of PRBs for PSSCH.,” is a bit unclear. Which value is finally used for *nPRB* should be clarified. | Agree, will be added  Agree, will be clarified. |
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# 3 Discussion – second round

The comments in this section are based on version 1 of the draft CR available in the **Post RAN1#114 discussion.**

Second checkpoint for this discussion:  **is September 6, 9.00 am UTC!**

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| Company | Comments | Editor reply/Notes |
| Samsung | We thank editor for the effort on addressing all the comments! Please find some further comments on the updated draft CR.  Comment 1: definition of sub-channel for interlace RB case  **Agreement**  For interlace RB-based PSCCH/PSSCH transmission in SL-U:   * Regarding mapping between sub-channel and interlace, 1 sub-channel is defined and indexed within 1 RB set, and is periodically indexed across different RB sets within the resource pool   According to RAN1 agreement, one sub-channel shall be PRBs in an interlace and in a RB-set, but the “RB-set” part is missing from current draft. The 10 PRB lower limit for interlace is also referring to one RB-set. We suggest the following change for clarity:   * If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, in the frequency domain, a sidelink resource pool consists of sl-NumSubchannel sub-channels in a RB-set, where each sub-channel consists of PRBs in *numInterlacePerSubchannel* interlaces having contiguous interlace indices and within the RB-set.   =============================================  - If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, the sub-channel *m* for consists of PRBs in a set of *numInterlacePerSubchannel* interlaces and within a RB-set, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211] in the RB-set.  Comment 2: Lowest RB of resource pool for interlace RB  We wonder is the lowest RB of resource pool still needed for interlace RB (didn’t see any functionality of it)? If not, the following can be deleted.   * If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, the sub-channel *m* for consists of a set of *numInterlacePerSubchannel* interlaces, where each interlace consists of at least 10 resource blocks as defined in clause 4.4.4.6 of [4, TS 38.211]. ~~The lowest RB in the resource pool is given by the higher layer parameter~~ *~~startRBResourcePool~~*~~.~~ 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.   Comment 3: TBS determination  Current draft didn’t give an explicit value for N\_symb^sh and n\_PRB in the equations when 2 starting symbols or interlace RB are configured. We suggest the following change:  - = *sl-LengthSymbols* -2, where *sl-LengthSymbols* is the number of sidelink symbols within the slot provided by higher layers. If *startingSymbolFirst* and *startingSymbolSecond* are provided for a sidelink resource pool, ~~the number of sidelink symbols assumed in transport block size determination~~ is ~~determined~~ given by a reference number of symbols, *numRefSymbolLength*, provided by higher layers.  ==============================================  - *nPRB* is the total number of allocated PRBs for the PSSCH. If the higher layer parameter *transmissionStructureForPSCCHandPSSCH* is set to ‘interlaceRB’, *nPRB* is given by a reference number of PRBs per interlace within 1 RB set, *numRefPRBOfInterlace*, ~~is~~ provided by higher layers ~~for determination of total number of PRBs for PSSCH.,~~ |  |
| Samsung2 | For Dynamic Co-existence  As there were no additional agreements made in RAN1#114, our preference is not make updates for this part on top of the CR after RAN1#113. However, as updates are being made, we would like to consider the following updates:  **Comment 1:**  In RAN1#110b-e, RAN1 made the following agreement, which is not captured:  **Agreement RAN1#110b-e**  For dynamic resource pool sharing, the NR SL module is expected to use the information shared by the LTE SL module to the NR SL module which is known by NR SL module at the latest T ms prior to slot n (as defined in clause 8.1.4 of TS 38.214), to determine a set of resources for its own (re)transmission.   * T is defined using   + T≤Tmax ms, and is based on UE implementation, according to the Rel-16 NR SL timeline for in-device coexistence.     - FFS: Value of Tmax * FFS: any discussion on the earliest information, if needed   To capture this agreement, we suggest to add the following: “The UE shall perform the procedures in 5LTE3 and 6LTE based on PSCCH decoded and RSRP measured in these LTE subframes provided by the LTE module to the NR module at time .”  **Comment 2:**  In RAN1#110b-e, RAN1 made the following agreement, and subsequent agreements which use the relevant information is not captured:  **Agreement RAN1#110b-e**  For dynamic resource pool sharing, the candidate information shared by the LTE SL module to the NR SL module may include one or more of the following parameters, to be down-selected:   * Time and frequency locations of reserved resources by other LTE UEs, determined based on decoded SCIs * SL RSRP measurement results * Resource reservation periods based on decoded SCI and for own LTE SL transmissions * Priority based on decoded SCI and for own LTE SL transmissions * Time and frequency location of resources used for own LTE SL transmissions * Candidate resource set SA or SB * SL RSSI measurements * LTE logical subframe related information * Resources corresponding to half-duplex subframes which are not monitored by the LTE SL UE   To capture this agreement, we suggest to add the following:  “The information shared by the LTE module shall include:   * Time and frequency locations of reserved resources by other LTE UEs, determined based on decoded PSCCHs. * SL RSRP measurement results of decoded PSCCHs. * Priority of decoded PSCCHs. * Time and frequency location of resources used for own LTE SL transmissions. * Priority of own LTE SL transmissions”   **Comment 3:**  In RAN1#110b-e, RAN1 made the following agreement:  **Agreement RAN1#110b-e**  The NR SL module uses the information from the starting LTE SL subframe to the ending LTE SL subframe in the shared information from the LTE SL module.   * The starting LTE SL subframe is no later than the time (n-T\_start)   + n is the time where NR SL module triggers its NR SL resource (re)selection procedure as defined in clause 8.1.4 of TS 38.214     - Option 1-2: T\_start is 1100ms * The ending LTE SL subframe is n-T\_valid2. Up to UE implementation to additionally use results from subframe(s) later than n-T\_valid2.   + T\_valid2 = T + 4 ms   We suggest the following update: “where, the procedure is triggered in slot , and is the LTE subframe ~~in which this procedure is triggered and~~ which overlaps slot *n*”  **Comment 4:**  We suggest to remove the square brackets around in “The ~~[~~LTE sensing window is defined by~~]~~ the range of LTE subframes …”  **Therefore, we suggest the following update for the 4 comments:**  2LTE) In case of dynamic co-channel coexistence of LTE sidelink and NR sidelink: The ~~[~~LTE sensing window is defined by~~]~~ the range of LTE subframes [], where, the procedure is triggered in slot , and is the LTE subframe ~~in which this procedure is triggered and~~ which overlaps slot n, is 1100 msec and is up to UE implementation under ; is 4+T msec, where T ≤ 4 msec. The UE shall perform the procedures in 5LTE3 and 6LTE based on PSCCH decoded and RSRP measured in these LTE subframes provided by the LTE module to the NR module at time . The information shared by the LTE module shall include:   * Time and frequency locations of reserved resources by other LTE UEs, determined based on decoded PSCCHs. * SL RSRP measurement results of decoded PSCCHs. * Priority of decoded PSCCHs. * Time and frequency location of resources used for own LTE SL transmissions. * Priority of own LTE SL transmissions.” |  |
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