3GPP TSG RAN WG1 Meeting #108-e R1-220xxxx

**e-Meeting, February 21st – March 3rd, 2022**

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**Source:** Moderator (LG Electronics)

**Title:** Feature lead summary #5 for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements

**Document for:** Discussion and information

1. **Draft proposals for 5th email discussion (Due: March 1st 4:59am UTC)**
   1. **Scheme 2**

**FL’s observation of 4th email discussion (clarification on the meaning of “next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission”)**

* Support: Fraunhofer, Intel, Apple, LGE, Qualcomm, Futurewei, CATT, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, xiaomi, Panasonic, NEC, MediaTek, DOCOMO (as compromise) (17)
* Not support: Sharp, InterDigital, Nokia (3)
* Comments:
  + No additional agreement is needed: Samsung, (1)

Q5-1: There was a comment in Monday’s GTW session that further discussion/decision is not necessary on the following draft conclusion 4-2. Company provides view on whether or not to agree it including the necessity of having further discussion/decision on it in this meeting (e.g., it can be handled with CR, if needed, in the subsequent meetings).

Draft conclusion 4-2:

When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,

* if there is a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion”,
  + the PSFCH occasion cannot be used by UE-A for a conflict indication for reserved PSSCH resource other than the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion

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| Company | Yes or no | Comments including the necessity of having further discussion/decision on it in this meeting (e.g., it can be handled with CR, if needed, in the subsequent meetings) |
| Intel | Yes |  |
| Fraunhofer | Yes | We are fine to agree with the proposal by the FL. |
| InterDigital | Comment | We can live with the proposal to make progress on this topic, but we believe further optimization is merited, especially for the scenario where two resources reserved in the same SCI with the time gap T1 (between reserved SCI and 1st reserved resource) and T2-T1 (between 1st and 2nd reserved resource) and both time gaps are too short to accommodate the minimum timeline specified in the agreement. In this scenario, PSFCH occasion available to indicate conflict for the 2nd resource is only available after the SCI reserving both resources. Thus, we prefer to have continued discussion in the maintenance stage. |
| Qualcomm | Comment | We propose the following edit [in red] to the draft conclusion so that signaling of conflicts on resources reserved for the next TB is supported as per the existing agreement:   * if there is a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion”,   + the PSFCH occasion cannot be used by UE-A for a conflict indication for reserved PSSCH resource other than the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion   + UE can still indicate a conflict for the next TB using this PSFCH occasion. |
| LGE | Yes | Regarding QC’s suggestion, we can add a note that the earliest reserved PSSCH resource indicated by the corresponding SCI is either for current TB transmission or next TB transmission.  When the next reserved resource is defined as the earliest reserved resource indicated by the corresponding SCI subject to the timeline of T\_3, it will allow the case where a reserved resource is associated with two PSFCH occasions. In this case, we may continue to further discuss about UE-A’s behavior for transmitting conflict indication(s) (e.g., which PSFCH occasion will be used for a conflict indication, or how may conflict indication will be transmitted for the same observation), and UE-B’s behavior for receiving conflict indication(s) (e.g., UE-B behavior when it receives conflict indications in both PSFCH occasions or when it receives a conflict indication in the earlier PSFCH occasion or when it receives a conflict indication in the later PSFCH occasion.  Since we already have two PSFCH timing for a conflict indication, if we want to protect this case (i.e., the time gap between PSFCH and first reserved resource indicated by UE-B’s SCI is smaller than T\_3), we can simply use Option 2 timing (i.e., PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI). |
| NTT DOCOMO | Accept with comment | As discussed over reflector, although we do not prefer this proposal, we accept for progress.  Regarding “next reserved resource”, there is another issue in our view as below. We hope this can be solved in maintenance stage.   * When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted, and * When a SCI reserved two resources, and * When both resources satisfies the agreed processing time constraints, and * If collision will occur at the 2nd resource from the two resources, then * UE-A transmits collision indication to UE-B, and UE-B does reselection of the 1st resource from the two resources. |
| NEC | Yes |  |
| Futurewei | Yes with comments | We are ok with this proposal. However, we do see there could be some benefit if the PSFCH occasion is used to indicate the 2nd reserved PSSCH. Since the PSFCH for conflict indication of the 2nd reserved PSSCH is derived by the SCI in the 1st reserved PSSCH, it could happen the PSFCH does not meet the time constraint too. Using the first PSFCH can be beneficial. But we need to specify the UE-B’s behavior for such indication.  In addition, if the first PSFCH is allowed for indication of 2nd reserved PSSCH, and the 2nd PSFCH for 2nd reserved PSSCH also satisfies the timing constraint, then there are two PSFCHs can be used to indicate the conflict of the 2nd reserved PSSCH. Again, further discussions are then needed.  So we are ok with the proposal but also open to use the PSFCH for the next (2nd ) PSSCH if companies prefer. |
| Apple | Yes | If the time gap T\_3 is not satisfied, then the indication cannot be used by UE-B. In this case, PSFCH occasion should not be used to indicate the collision of the earliest reserved PSSCH resource.  On the other hand, we do not think it is suitable for this PSFCH occasion to indicate a collision for reserved PSSCH resource other than the earliest reserved PSSSCH resource since that is against the existing agreement. |
| Ericsson | Yes | We think that this conclusion is necessary. Nevertheless, it can also be handled if there is no consensus about it right now in the CR phase. |
| Spreadtrum | Yes | We prefer no optimization to the case where the PSFCH occasion corresponding to SCI for indicating the conflict of 1st reserved resource which is used to indicate the conflict of 2nd reserved resource, at this late stage. |
| Xiaomi | Yes |  |
| Panasonic | Yes | From above draft conclusion, it is clear that the only 1st reserved resource (the earliest reserved PSSCH resource) is candidate of collision indication and 2nd reserved resource is not candidate of collision indication even if 1st reserved resource doesn’t satisfy T\_3 timing. |
| Vivo | Yes |  |
| Samsung | Yes | This proposal is redundant with earlier proposals.   * We have agreed that the indication is for the earliest reserved resource. * We have agreed that if the timeline is not satisfied there will be no transmission of conflict indication.   Both of these imply that the PSFCH occasion is not used.  While this proposal is redundant, it we can agree to a more simplified version:  When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,   * if ~~there is~~ a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but ~~not satisfying~~ doesn’t satisfy “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion”,   + the PSFCH occasion cannot be used by UE-A for a conflict indication for any reserved PSSCH resource ~~other than the earliest reserved PSSCH resource~~ indicated by the corresponding SCI ~~after the PSFCH occasion~~ |
| Sharp | OK | As we commented in the previous round, we share the same understanding on the desired UE behavior as what the proposal says although we have a problem understanding how this would interact with existing RAN1 agreements. As a compromise we are fine to conclude this by following the majority. |
| OPPO | Yes with comments | The conclusion has already been implied by the existing agreements, that is the conflict indication is for the next reserved resource indicated by the corresponding SCI, and the conflict indication is not transmitted if the timeline is not satisfied. Othe optimization is not advisable at this stage.  The addition from QC is confusing for us, in our understanding, under the condition descripted by the main bullet, the PSFCH occasion cannot be used for next TB either. |
| Fujitsu | Yes | The issue is necessary to be clarified. However, we think it can be handled with CR. The proposal only considers the case when PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted. A similar issue may also exist when PSFCH occasion is derived by a slot where the conflict occurs. Assume a conflicted PSSCH is reserved by SCI1 and SCI2. For a derived PSFCH, it can happen that T\_3 is satisfied and sl-MinTimeGapPSFCH is not satisfied for the most recent SCI2 but satisfied for SCI1 before SCI2. It may also need to clarify whether such a PSFCH can be used for a conflict indication or not. These two cases may be handled together in the CR phase. |

* 1. **Scheme 1**

**FL’s observation of 4th email discussion (Cast type of inter-UE coordination information transmission triggered by a condition other than explicit request reception)**

* Support: Nokia, Apple, LGE, Qualcomm, DCM, Futurewei, CATT, OPPO, Fujitsu, Spreadtrum, Sharp, xiaomi, InterDigital, Panasonic, (14)
* Not support: Fraunhofer, Intel, Samsung, Huawei, (4)
  + Apply the same principle for the case when it is multiplexed with other data: Fraunhofer, Huawei, (2)
  + Groupcast set can be (pre)configured: Samsung, (1)
  + It is up to RAN2: Huawei, (1)

Q5-2: **FL understands that as per RAN1 agreement, only unicast can be used for transmission of inter-UE coordination information with preferred resource set even when it is triggered by a condition other than explicit request reception. Also as it was already agreed that inter-UE coordination information can be multiplexed with other data only if the source/destination ID pair is the same, it is clear that the cast type is aligned between inter-UE coordination information and other data when they are multiplexed.** One remaining issue is how UE-A determines cast type for transmission of inter-UE coordination information with non-preferred resource set when it is not multiplexed with other data. Do you agree following updated draft conclusion?

Updated Draft conclusion 3-12:

* For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,
  + When it is not multiplexed with other data, UE-A determines its cast type by implementation

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| Company | Yes or no | Comments |
| Intel | No | Standalone condition-based feedback is very costly from overall system performance perspective, as it was shown by system level evaluations. In our view leaving this aspect up to UE implementation may have significant impact on overall system performance and should not be pursued further.  Note that at this stage, conditions for transmission of standalone condition-based feedback are not defined.  Our proposal is to have fixed or pre-configured cast type for condition-based feedback (e.g., standalone condition-based feedback is broadcast) |
| Fraunhofer | No | This conclusion is different from what was proposed in earlier rounds. We do not see the need to add the additional information on whether it is multiplexed with other data or not in this proposal. We prefer the original wording of the proposal.   * For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,   ~~When it is not multiplexed with other data,~~ UE-A determines its cast type by implementation |
| InterDigital | Yes |  |
| Qualcomm | Yes | We prefer broadcast for signaling non-preferred resources but agree to the conclusion for progress. |
| LGE | Yes | First of all, conditions for transmission of standalone condition-based feedback is already covered by following agreements.   * *Agreement:*   + *For inter-UE coordination triggered by a condition rather than request reception in Scheme 1,*      - *A resource pool level (pre-)configuration can enable one of the following alternatives:*       * *Alt 1: it is up to UE-A’s implementation whether or not to trigger the inter-UE coordination information generation.*       * *Alt 2: the inter-UE coordination information generation can be triggered only when UE-A has data to be transmitted together with the inter-UE coordination information to UE-B*     - *Note: Rel-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control is applied to the transmission of the inter-UE coordination information triggered by a condition.* * *Agreement:*   + *For inter-UE coordination information transmission in Scheme 1,*      - *Inter-UE coordination information can be multiplexed with other data only if the source/destination ID pair is the same*       * *Retransmission of the TB carrying inter-UE coordination information is supported*   Considering that the UE-A will determine whether or not to trigger standalone condition-based feedback, it seems that this proposal is quite aligned with the previous agreement. To be specific, the cast type is also determined by UE-A’s implementation. |
| NTT DOCOMO | Yes | We have same understanding with FL. We do not need to discuss request-based scheme 1 and condition-based scheme 1 with data mux, for this issue. Then we do not see any necessity to define a rule of cast-type determination. |
| NEC | Yes |  |
| Futurewei | Yes with comments | Our understanding is that for the case of multiplexiting with other data, we already have the agreement that it can only happen when the source/destination ID pair is the same. The cast type, whichever is supported for non-preferred resource set, would be the same as that for the other data transmission. If our understanding is correct, we support this proposal. Otherwise, we may need to include the case when it is multiplexed with other data. |
| Apple | Yes | Broadcast, groupcast and unicast of IUC for non-preferred resource set triggered by a condition are supported. UE-A can determine the IUC cast type by implementation. |
| Spreadtrum | Yes |  |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |
| vivo | Comment | For condition based IUC, we have two conditions to send IUC, i.e., based on implementation or based on TB transmission. For non-preferred resource, we think IUC should be transmitted with TB considering signaling overhead. Therefore, we are fine to withdraw this proposal, without conclusion it means no optimization for the case when the IUC is not multiplexed with other data. |
| Samsung | No | For non-preferred resource set triggered by a condition other than explicit request only supports broadcast, groupcast can also be supported, but this would require a higher layer parameter.  We don’t see a benefit in supporting unicast for non-preferred resources. If a resource is non-preferred, it would be non-preferred for more than one UE, hence unicast transmission is not an efficient use of the air interface capacity. |
| Sharp | Yes |  |
| OPPO | yes | Which cast type is suitable for the transmission of non-preferred resource set is dependent on the condition(s) used to determine the resources, for Option 2 of Condition 1-B-1, broadcast is more suitable, but for Option1 of Condition 1-B-1 or Condition 1-B-2, unicast/groupcast may be better if UE-A is in unicast/groupcast with UE-B. As the non-preferred resources may be determined based on different conditions, we do not think one cast type is better than others. |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A)**

* Alt 1: Fraunhofer, Nokia, LGE, DCM, Ericsson, Panasonic, (6)
* Alt 1 with modification:
  + Remove sub-bullet of Option 1: Intel, Futurewei, (2)
  + Replace “all” with “applicable” in 2nd bullet: Intel, (1)
  + Remove 3rd bullet: Intel, (1)
  + Remove “to be transmitted to the UE-A” in 2nd bullet: Qualcomm, (1)
  + Use the latest IUC for all the cases: Samsung, CATT, (2)
  + Up to UE implementation for 3rd bullet: vivo, Apple, (2)
* Alt 2: LGE, Huawei, InterDigital, (3)

Q5-3: Company provides which alternative is supported for UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A. **FL tried to reflect the views of the companies in Alt 1 as much as possible, and the current version of Alt 1 could be the compromise. Note that simply commenting over and over only what companies want doesn’t help to make progress. Before making comments, please consider this and suggest other compromise if really needed. Also in 4th email discussion, please check the answers given by the proponents of Alt 1 to the concerns raised by the proponents of Alt 2.**

Updated Draft proposal 3-13:

Alt 1:

* For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,
  + Option 1: UE-B uses the latest received preferred resource set from the same UE-A subject to UE processing timeline for its resource selection for a TB to be transmitted to the UE-A.
    - ~~It is up to UE-B's implementation on how to determine the latest received preferred resource set~~
* For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,
  + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A subject to UE processing timeline. UE-B uses the final non-preferred resource set for its resource selection ~~for a TB to be transmitted to the UE-A~~.
* For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,
  + ~~Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.~~
  + It is up to UE-B implementation to use one or multiple of them in its resource (re)selection

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the same UE-A, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

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| Company | Alt | Comments |
| Intel | Alt.1 w/ comments | 1. Clarification: Replace “subject to UE processing timeline” with “subject to UE inter-UE coordination feedback processing timeline”. Continue discussion on definition of inter-UE coordination feedback processing timeline 2. Proposed compromise: Apply the following change to the last sub-bullet “It is up to UE-B implementation to use ~~one or multiple of them~~ preferred resource set in its resource (re)selection” |
| Fraunhofer | Alt 1 | Both UE-A and UE-B would need these UE behaviors defined for the mutual understanding of IUCs being transmitted/received. Hence, we do not prefer Alt 2. |
| InterDigital | Alt 2 | We can accept Alt-1 for the progress |
| Qualcomm | Alt 1 | We support Alt 1 with the changes to the last bullet as a compromise. |
| LGE | Alt 1 or Alt 2 | Either way is fine to us. The important thing is make a decision without specification hole in this stage.  Regarding the 2nd suggestion by Intel, that possibility is already included in FL’ proposal. Restricting it further would be no longer a compromise. |
| NTT DOCOMO | Alt 1 | We support Alt 1 as compromise. |
| NEC | Alt.1 |  |
| Futurewei | Alt 1 with comment | We are fine with the updates on the first two, multiple preferred set or multiple non-preferred resource set.  However, we do not agree the updates for the third one, when UE-B receives one preferred set and one non-preferred set.  Since UE-A sends two sets, it would be better to use both sets for resource selection. For example, if UE-B only uses the preferred set, based on agreed UE-B’s behavior, UE-B may select the resource outsize preferred set in S\_A which may include the resources in the non-preferred set. Therefore, we prefer the option 3 in previous version.   * For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,   + Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.   + ~~It is up to UE-B implementation to use one or multiple of them in its resource (re)selection~~ |
| Apple | Alt 1 with modification | In Alt 1 first bullet, what is the case if UE-B’s TB is not to be transmitted to UE-A, but UE-B receives preferred resource set from UE-A? This scenario may occur when IUC is triggered by a condition other than explicit request. Hence, we suggest removing the restriction “to be transmitted to the UE-A” from the proposal.   * For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,   + Option 1: UE-B uses the latest received preferred resource set from the same UE-A subject to UE processing timeline for its resource selection ~~for a TB to be transmitted to the UE-A~~. |
| Ericsson | Alt.1 with modifications | For the last bullet, i.e., both preferred and non-preferred, we think that the best way is to have a behavior which is aligned with the mechanism used when only preferred or non-preferred resource set is received. Therefore, we are supportive of keeping the third bullet as it was in the previous round, i.e., without leaving it up to UE implementation. |
| Spreadtrum | Alt 1 | We are also fine with Alt 2. |
| xiaomi | Alt 1 or 2 | We are fine with either one, but we more prefer alt2. |
| Panasonic | Alt 1 |  |
| Vivo | Alt 1 | We support the proposal, with understanding that the latest IUC should always match the TB transmission requirement, e.g., sub-channel size, and we need further discussion on how to guarantee this point. |
| Samsung | Alt1 modified | For non-preferred resources:   * What is the benefit of taking the union of the non-preferred resource rather than the latest?   Therefore, for non-preferred resources, we should use option 1.  For preferred resources and non-preferred resources, this would be a combination of the two cases:   * When UE is transmitting to UE-A, it can use the latest of preferred or non-preferred resources. We are also open to using the latest preferred resource and the latest non-preferred resources.   When UE is transmitting to any UE but UE-A, it can use the latest non-preferred resources. |
| Sharp | Alt 2 | We still prefer Alt 2, but are fine to accept the latest Alt 1 as compromise. |
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**FL’s observation of 4th email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the different UE-As)**

* Alt 1: LGE, DCM, Ericsson, Panasonic, (4)
* Alt 1 with modification:
  + Remove 2nd bulllet: Fraunhofer, (1)
  + Add “Applicable“ before “received“: Intel, (1)
  + Add “In case of groupcast to the multiple UE-As, UE-B selects resources from the intersection of the received preferred resource sets“: Nokia, CATT, (2)
  + Remove “to these different UE-As providing the non-preferred resource set”: Qualcomm, Samsung, (2)
  + Use each non-preferred resource set for each UE-A: Futurewei, (1)
  + Up to UE implementation for 3rd bullet: Apple, vivo, (2)
* Alt 2: LGE, Huawei, InterDigital, (3)

Q5-4: Company provides which alternative is supported for UE-B’s ehaviour when UE-B receives multiple resource sets from the different UE-As. **FL tried to reflect the views of the companies in Alt 1 as much as possible, and the current version of Alt 1 could be the compromise. Note that simply commenting over and over only what companies want doesn’t help to make progress. Before making comments, please consider this and suggest other compromise if really needed. Also in 4th email discussion, please check the answers given by the proponents of Alt 1 to the concerns raised by the proponents of Alt 2.**

Draft proposal 3-14:

Alt 1:

* For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,
  + Option 1: UE-B uses each received preferred resource set subject to UE processing timeline for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.
* For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.
  + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As subject to UE processing timeline. UE-B uses the final non-preferred resource set for its resource selection ~~for TB(s) to be transmitted to these different UE-As providing the non-preferred resource sets~~.
* For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,
  + ~~Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.~~
  + it is up to UE-B implementation to use one or multiple of them in its resource (re)selection

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

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| Company | Alt | Comments |
| Intel | Alt.1 w/ comments | 1. Clarification: Replace “subject to UE processing timeline” with “subject to UE inter-UE coordination feedback processing timeline”. Continue discussion on definition of inter-UE coordination feedback processing timeline 2. Last sub-bullet: We prefer to use both sets. As a compromise we can accept it with the following underline change: “it is up to UE-B implementation to use none, one or multiple of them in its resource (re)selection” |
| Fraunhofer | Alt 1, with comments | For the second bullet, we feel that there is some ambiguity with the direction and the solution.  In the case where UE-B receives multiple non-preferred resource sets from different UE-As **pertaining to different TBs** (as is the case for the first bullet), we prefer the following wording:   * + UE-B uses each received non-preferred resource set subject to UE processing timeline for its resource selection for each TB to be transmitted to each UE-A providing the non-preferred resource set.   In the case where UE-B receives multiple non-preferred resource sets from different UE-As **pertaining to the same TB**, we prefer to add the additional text (in red):   * + UE-B determines a final non-preferred resource set by making a union of all the received non-preferred resource sets from different UE-As subject to UE processing timeline. UE-B uses the final non-preferred resource set for its resource selection subject to the location of the UE‑As. |
| InterDigital | Alt 2 | We can accept Alt 1 if majority support for the progress |
| Qualcomm | Alt 1 | We support Alt 1 with the changes to the last bullet as a compromise. |
| LGE | Alt 1 or Alt 2 | Regarding Franhofer’s comments, currently, we did not agree any indicator field for UE-A to indicate whether the non-preferred resource set is associated with the same TB or not. Current FL’s proposal seems more reasonable in this stage. |
| NTT DOCOMO | Alt 1 | We support Alt 1 as compromise. |
| NEC | Alt.1 |  |
| Futurewei | Alt 1 with modification | We are fine with first two behaviors. One correction on the FL’s summary on our position for non-preferred set. We supported FL’s previous Alt 1 proposal. Our previous modification on the non-preferred is to only use the entire slots of resources in each non-preferred resource set for each UE-A, (UE-B considers these slots are from 1-B-2 half duplex by guess) which were excluded from the union. But anyway, that was our second preference to address other companies’ concern.  We do not support the updates on the last one when UE-B receives both preferred resource set and non-preferred resource set from different UEs. UE-B would use non-preferred resource set from resource selection for both UEs as if not used for the UE sending preferred resource set, UE-B may schedule resources on the UE-A’s non-preferred resource set, causing potential conflict.  Therefore, for UE-B receiving both preferred and non-preferred resource sets, we prefer option 2 in previous version of proposal.   * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.   + ~~it is up to UE-B implementation to use one or multiple of them in its resource (re)selection~~ |
| Apple | Alt 1 with modification | In Alt 1 first bullet, what is the case if UE-B’s TB is to be transmitted to a UE, which does not provide preferred resource set? In this case, we could leave it to UE-B’s implementation.   * For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,   + Option 1: UE-B uses each received preferred resource set subject to UE processing timeline for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.     - it is up to UE-B implementation, whether or not use one or multiple of them in its resource (re)selection, for a TB to be transmitted to a UE not providing the preferred resource set. |
| Ericsson | Alt.1 with modifications | For the last bullet, i.e., both preferred and non-preferred, we think that the best way is to have a behavior which is aligned with the mechanism used when only preferred or non-preferred resource set is received. Therefore, we are supportive of keeping the third bullet as it was in the previous round, i.e., without leaving it up to UE implementation. |
| Spreadtrum | Alt 1 | We are also fine with Alt 2. |
| xiaomi | Alt 2 |  |
| Panasonic | Alt 1 |  |
| Vivo | Alt.1 |  |
| Samsung | Modified Alt1 | Fine with the first two parts. For the third part (just a combination of parts 1 and 2):   * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + ~~Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.~~   + ~~it is up to UE-B implementation to use one or multiple of them in its resource (re)selection~~   + UE-B uses for its resource selection both of the following:     - A final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As subject to UE processing timeline     - A Preferred resource set from a UE-A (if any) subject to UE processing timeline when transmitting to the UE-A. |
| Sharp | Alt 2 | We still prefer Alt 2, but are fine to accept the latest Alt 1 as compromise. |
|  |  |  |

**FL’s observation of 4th email discussion ((pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set)**

* Support: Fraunhofer, Intel, Apple, LGE, Qualcomm, Samsung, DCM, Futurewei, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, Sharp, xiaomi, InterDigital, Panasonic, (19)
* Comments:
  + Add “T\_1 <= Tproc,1” as note: Intel, LGE, vivo, (3)
  + Remove note: Huawei, (1)

Q5-5: Do you agree following updated draft conclusion on (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set?

Updated Draft conclusion 3-1:

Not support (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the set of preferred resources in inter-UE coordination information triggered by a condition other than explicit request reception.

* Note that T\_2 is no smaller than T\_2,min and 0<=T\_1 <= Tproc,1 as specified in TS 38.214 section 8.1.4.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes |  |
| Fraunhofer | Yes |  |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | Yes |  |
| NTT DOCOMO | Yes |  |
| NEC | Yes |  |
| Futurewei | Yes | We are ok with the proposal and the note. |
| Apple | Yes |  |
| Ericsson | Yes with comment | We think that the note is important in this conclusion. |
| Spreadtrum | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Comment | Main proposal is fine. Sub-bullet is not needed.  We should define which slot is slot n, is it the slot the IUC is transmitted in? |
| Sharp | Yes |  |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured)**

* Support: Intel, Apple, LGE, Qualcomm, Samsung, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, Sharp, xiaomi, InterDigital, Panasonic, (16)
* Not support: Fraunhofer, Nokia, DCM, Futurewei, (4)
* Comments:
  + Remover sub-bullet: Fraunhofer, Intel, Nokia, DCM, Futurewei, (5)

Q5-6: Do you agree following updated draft conclusion for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured?

Updated Draft conclusion 3-11:

In RAN1, no further decision is necessary for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured

* It is up to RAN2 whether/how to additionally handle this case (e.g., defining default priority value)

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes |  |
| Fraunhofer | Comment | We are fine with the main bullet, and prefer that the priority value be left up to UE implementation. |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | Yes | Regarding the sub-bullet, it is already an outcome of a compromise. There is no need to remove it. |
| NTT DOCOMO | Yes | We accept this as it is for progress. |
| NEC | Yes |  |
| Futurewei | comment | As we suggested, the subbullet should be removed. In previous round, there were no responses on removing the subbullet proposed by several companies including us, meaning that there is no strong concern on removing the subbullet. |
| Apple | Yes | We are also fine without the sub-bullet. |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| xiaomi | Yes with comment | We prefer to remove the sub-bullet, the priority value is up to ue implementation, but we also accept this conclusion for the meeting progress. |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Yes |  |
| Sharp | Yes |  |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (Cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used)**

* Support: Intel, LGE, Qualcomm, DCM, CATT, Huawei, OPPO, Spreadtrum, vivo, Sharp, InterDigital, Panasonic, (12)
* Not support: Fraunhofer, Nokia, Samsung, Futurewei, (4)

Q5-7: **RAN1 already agreed that SCI format 2-C is UE RX optional. FL understands that in the case of GC/BC, it would be difficult for a UE transmitting inter-UE coordination information using SCI format 2-C to know whether or not target receiver(s) have the capability of SCI format 2-C reception. Note that in the Rel-17 UE feature discussion, the singling exchange of capability of SCI format 2-C reception between UEs was agreed, and RAN2 will work on the design of higher layer signaling for this purpose in case of UC.** Do you agree following updated draft conclusion for cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used? **Note that the wording of “in addition to MAC CE” is necessary because this conclusion targets the case where both SCI format 2-C and MAC CE are used for inter-UE coordination information transmission.**

Updated Draft proposal 3-8:

* For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE only when its cast type is unicast regardless of whether or not it is multiplexed with other data

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes |  |
| Fraunhofer | No | As mentioned by Nokia and Futurewei in the previous rounds, if the destination ID can be a groupcast ID, we do not see the need to restrict the use of SCI 2-C to unicast alone, and can support groupcast.   * For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE ~~only~~ when its cast type is unicast and groupcast regardless of whether or not it is multiplexed with other data |
| InterDigital | Yes |  |
| Qualcomm | Yes | We propose the following edit for clarity:   * For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE only when ~~it’s~~ the cast type is unicast regardless of whether or not it is multiplexed with other data   We would also like to emphasize that there is no provision in specifications to have separate destination ID space for each cast-type. This issue was discussed in Rel-16, and it was concluded that destination ID cannot be used to deduce cast type. |
| LGE | Yes | As mentioned before, we need to think about the motivation of the cast type indicator introduced in Rel-16. UE may or may not distinguish cast type by using only ID(s). In other words, ID collision can happen across different cast types. In this case, SCI format needs to include cast type (like a SCI format 2-A) or to be tied with a certain cast type (like a SCI format 2-B). Since we already agreed not to include cast type indication in a SCI format 2-C, FL’s proposal is only remaining option. |
| NTT DOCOMO | Yes | Same view with QC. This is why we had cast-type indication field in Rel-16 SL. There would be no reason to change this direction from Rel-17. |
| NEC | Yes |  |
| Futurewei | Yes | Based on LGE’s comments about Rel-16 discussions on necessity of cast type indicator in the 2nd SCI, we are ok to accept this proposal given that the cast type indicator is not included in SCI-2C. |
| Apple | Yes |  |
| Spreadtrum | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Yes | O.K to make progress |
| Sharp | Yes |  |
| OPPO | yes | Capability exchange is via PC5-RRC, which only exists in unicast, so SCI format 2-C cannot be used for broadcast/groupcast. |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (Additional criteria on which received preferred non-preferred resource set(s) can be actually taken into account in UE-B’s resource selection)**

* Support: Fraunhofer, LGE, Qualcomm, DCM, Futurewei, Huawei, OPPO, Fujitsu, Spreadtrum, Fujitsu, Sharp, xiaomi, InterDigital, Panasonic, (14)
* Not support: Intel, Ericsson, vivo, (3)
* FFS: Apple, (1)
* Comments:
  + Remove “additional”: Huawei, (1)

Q5-8: Do you agree following draft conclusion for additional criteria on which received preferred non-preferred resource set(s) are taken into account in UE-B’s resource selection?

Draft conclusion 3-15:

RAN1 does not pursue defining additional criteria on filtering the received preferred or non-preferred resource set(s) to be taken into account in UE-B’s resource selection

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | No | Rather than wasting time on unnecessary conclusion, let us ask FL to open discussion on potential filtering criteria. Unfortunately, this topic is discussed first-time during WI. It is proposed to discuss the following filtering criteria:   * Feedback type (e.g., request- or condition- based, preferred or non-preferred resource sets) * Feedback source ID * Feedback generation time * Overlap ratio of resource selection windows * Radio range or geographical distance from the source of inter-UE coordination feedback * Priority level used for generation of inter-UE coordination feedback   Additional criteria are needed. UE-B can receive and may need to process multiple feedback of different types from different UEs and with different formats. |
| Fraunhofer | Comment | We are open to discussing possible criteria, but if it is not possible, we can accept the conclusion. |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | Yes | As in another note, it would be helpful to add note “UE-B determines which received preferred or non-preferred resource set(s) to be taken into account by it s implementation in its resource selection”.  If we still cannot agree this conclusion, we are also fine with “There is no consensus…”. |
| NTT DOCOMO | Yes | We understand the motivation of further criteria, but we are fine with the conclusion considering the remaining time. |
| NEC | Yes |  |
| Futurewei | Yes with comments | We can accept the proposal for progress although we feel a certain timing gap is needed. |
| Apple |  | Although we do not think the conclusion is really needed, we could follow the majority companies view. |
| Ericsson | No | It is important to consider the distance between the UE-A and UE-B in order for UE-B to make a reliable decision, i.e., consider only the resource sets which are relevant for its transmission. |
| Spreadtrum | Yes |  |
| xiaomi | Yes | Defining additional criteria will need more discussion, further optimization is not necessary at this stage. |
| Panasonic | Yes |  |
| vivo | Comment | we think at least the preferred resource should match the TB transmission requirement, e.g., the same sub-channel size between preferred resource and candidate resource in resource selection. |
| Samsung |  | OK. But no conclusion is also fine. |
| Sharp | Yes |  |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (Sensing window for determining the set of resources)**

* Support: Fraunhofer, LGE, Qualcomm, DCM, CATT, OPPO, Fujitsu, Spreadtrum, Sharp, InterDigital, Panasonic, (11)
* Not support: Intel, Futurewei, Huawei, vivo, (4)
* Comments:
  + Add relationship between a resource selection window for determining the set of resources and a resource selection window for transmitting the set of resources: Intel, (1)
  + Clarification on re-evaluation for the set of resources as per Rel-16 procedure: LGE, Qualcomm, OPPO, Ericsson, Spreadtrum, xiaomi, (6)
    - UE-A is required to perform at least one mandatory reevaluation at slot n’-T\_3. It is up to UE-A to perform any extra reevaluation before slot n’-T\_3: Qualcomm, (1)
    - It is up to UE-A to further update the set of resources before it is transmitted: OPPO, (1)
  + Remove last bullet: CATT, vivo, InterDigital, (3)
  + Remove n’ part: Huawei, (1)
  + Replace “n>=n’” with “n>n’”: vivo,

Q5-9: Do you agree following updated draft conclusion for sensing window for determining the set of resources? **Note that there were a few companies that prefer to remove the blue marked part and companies’ views were not converged on it**.

Updated Draft conclusion 3-10:

For sensing window for determining the set of resources in Scheme 1,

* No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) – T\_0 – T\_1 determined by UE-A, (n+T\_1) – T\_proc,0 – T\_1 determined by UE-A ].
  + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.
  + For inter-UE coordination information triggered by a condition other than explicit request reception, n+T\_1 and n+T\_2 are determined by UE-A’s implementation. ~~With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.~~
* ~~Re-evaluation for the set of resources is supported as per Rel-16 procedures.~~

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Yes or no | | Comments | |
| Intel | No | | Proposal does not work for request-based feedback.  We repeat our comments as those seems not reflected:   * If inter-UE coordination information is triggered by an explicit request,   + (n+T\_1) ≤ (n’+T’\_1)   + (n’+T’\_2) ≤ (n+T\_2)   where   * + - (n+T\_1) – Start slot of resource selection window for determining the set of resources     - (n+T\_2) – End slot of resource selection window for determining the set of resources     - (n’+T’\_1) – Start slot of resource selection window used for inter-UE coordination information transmission     - (n’+T’\_2) – End slot of resource selection window used for inter-UE coordination information transmission   Keep the text in blue for the second last bullet “With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.” | |
| Fraunhofer | Yes | |  | |
| InterDigital | Yes | | When performing re-evaluation per R16 procedure, PHY layer is provided with a set of resources subjected to re-evaluation from MAC layer (the selected resources) to determine whether a re-evaluation should be reported to MAC layer. Thus we’d like to understand how such re-evaluation per R16 specification may apply when UE-A’s MAC layer does not perform the resource selection. | |
| Qualcomm | Comment | | In the case when n < n’, we are discarding information received between n’-T\_proc,0 to n-T\_proc,0. Hence, we believe it is necessary to add the note clarifying that n > n’ to ensure that the latest sensing results are used to determine the set of resources. Thus, we propose to include the following text:   * + With ~~n>= n’~~ n > n’, where n’ is the slot in which inter-UE coordination information generation is triggered.   Even though some companies think it is clear that the relationship n > n’ holds, to avoid future ambiguities (especially for a general reader of the specifications) we would be okay to capture this as a note. | |
| NTT DOCOMO | Yes | |  | |
| NEC | Yes | |  | |
| Futurewei | No | | Our concerns provided in previous round seems not taken into account or responded to.  Since UE-A needs a certain RSW to transmit the coordination, and UE-B needs a processing time T\_proc,1 to select resources for its TB transmission, if UE-A sensing ends at (n+T\_1) - T\_proc,0 - T\_1 (where T\_proc,0 is the sensing processing time and T\_1 is resource selection at UE-A), some resources in coordination information close to n+T\_1 cannot be used for UE-B’s resources because the time for corresponding slots passed.  This is more critical for request based IUC, as UE-B sends the request with n+T1 information, and UE-B expects to receive coordination information before (n+T1)-Tproc,1 for its resource selection.  Therefore, we propose to update the ending time of sensing. For simplicity, we propose following simple update on sensing window, where T2min is the min RSW for UE-A resource selection for coordination information transmission, Tproc,1 is processing time for UE-B resource selection.  [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0-Tproc,1-T2min - T\_1 determined by UE-A ). | |
| Apple |  | | Some clarification of the proposal is needed.   1. It is mentioned “range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A)” in the proposal. What is determined by UE-A? Is it “T\_1” determined by UE-A? 2. If UE-A determines the IUC contents at the slot very close to (n+T\_1), then UE-A will have a problem to transmit IUC information promptly, since it is desirable that IUC information is transmitted before (n+T\_1) or the first indicated resources in IUC. Our preference is that UE-A immediately determines the IUC contents at the triggering slot. This gives UE-A enough time to transmit IUC information. | |
| Ericsson | Yes | | We can accept this conclusion. | |
| Spreadtrum | Yes | |  | |
| xiaomi | Yes with Comment | | We think the definition of slot n is unclear, there have two understanding, UE-A generates inter-UE coordination information at slot n, or UE-A makes a resource selection at slot n, so it is necessary to clarify the slot n.  And we think there need another clarification, “n+T\_1 and n+T\_2 are provided by the request”, the value of T\_1 is determined by UE-B, “(n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A “, the value of second T\_1 is determined by UE-A. | |
| Panasonic | Yes | |  | |
| vivo | No, Comment | | After further check of the discussion, we think the proposal is not acceptable to us.  For request based preferred/non-preferred resource selection, we think the proposal add unnecessary restriction for IUC resource selection.  For resource selection IUC, we agree that mode 2 resource selection is reused, where slot n and PDB can be provided by MAC layer. If we restrict the selection window as the window provided by request, then we need further discuss how to bound the PDB for IUC transmission resource selection, e.g., PDB for IUC resource selection is before the starting time of selection window as illustrated in case 1  We think the PDB for IUC should not be restricted. after resource selection of IUC, MAC continue resource selection for prefer/non-preferred resource, where slot n and PDB are provided by MAC based on resource selection window provided by the request as illustrated in case 2. Thus, following is proposed.     * No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A ).   + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are ~~provided by the request~~ determined according to Rel-16 TS 38.214 Section 8.1.4. With n > = n’, where n’ is the slot in which inter-UE coordination information generation is triggered and n is selected so that [n+T\_1, n+T2] is located within the selection window provided by the request.   Also for condition based IUC transmission, we can simply say slot n and remaining PDB are decided by UE implementation   * + For inter-UE coordination information triggered by a condition other than explicit request reception, ~~n+T\_1~~slot n and ~~n+T\_2~~ remaining PDB are determined by UE-A’s implementation. | |
| Samsung | Comment | | Intention of proposal is OK, but it is too verbose! Maybe we can say:  The sensing window for determining the set of resources in Scheme 1, is determined relative to the resource selection window of the set of resources by re-using the Rel-16 sensing window design. | |
| Sharp | Yes | |  | |
| OPPO | | yes | |  |
| Fujitsu | Yes | |  | |

**FL’s observation of 4th email discussion (Additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total)**

* Support: LGE, Qualcomm, DCM, Futurewei, CATT, OPPO, Huawei, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (12)
* Not support: Fraunhofer, Intel, Nokia, Samsung, Ericsson, (5)
* Comments:
  + Fallback to TX candidate resource set: Intel, LGE, Ericsson, OPPO, xiaomi, (5)
  + Allowing partial overlapping between candidate single-slot resources and non-preferred resources: Nokia, (1)
  + Different preference levels are indicated for non-preferred resources: Samsung, (1)
  + Replace “how to meet this requirement” with “whether or not to use the received non-preferred resource set”: Huawei, (1)
  + Add “to use none or part of the non-preferred resource(s) to meet the requirement of X\*M\_total, when applying all the non-preferred resource(s) cannot meet the requirement of X\*M\_total”: vivo, (1)

Q5-10: Company provides which alternative is supported for additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total?

Updated Draft proposal 3-16:

Alt 1:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* It is up to UE-B’s implementation whether/how to take the received non-preferred resource set in its resource selection to meet this requirement

Alt 2:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* UE-B does not take the received non-preferred resource set in its resource selection.

|  |  |  |
| --- | --- | --- |
| Company | Alt | Comments |
| Intel | Comments | We can accept Alt.2 for the sake of progress |
| Fraunhofer | Comment | We do not think UE-B discarding the non-preferred resource set is ideal because UE-B would be then including resources where collisions are possible to its candidate resource set. We are fine with UE-B increasing the threshold and repeating the process, as described in the current specifications (step 7).  If the group cannot converge, we can accept the Alt 1 as a compromise. |
| InterDigital | Alt 1 |  |
| Qualcomm | Alt 1 | We agree with the updates to Alt 1. |
| LGE | Alt 1 or Alt 2 | Either direction is fine.  We understand that this issue is to handle the case where RSRP threshold boosting in Step 7 cannot resolve (aka infinite loop problem). |
| NTT DOCOMO | Alt 1 |  |
| NEC | Either one | Alt.2 is our first preference |
| Futurewei | Alt 1 | We support Alt 1. Completely ignoring non-preferred resource set will cause collisions, which should be avoided. |
| Apple | Alt 1 | We think Alt 2 is too restrictive.  UE-B may still use part of the received non-preferred resource set in its resource selection to meet the requirement of X\*M\_total. We could leave this to UE-B’s implementation. |
| Ericsson | None | We think that the simplest way instead of leaving up to UE implementation or to discard the inter-UE coordination message is to use its own resource set.  We propose as a potential compromise to include the following:  Alt 1’:  For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,   * If UE-B has its own resource set information, it uses this candidate resource set as fallback * Otherwise, It is up to UE-B’s implementation whether/how to take the received non-preferred resource set in its resource selection to meet this requirement |
| Spreadtrum | Alt 1 |  |
| xiaomi | Alt2 | We don’t think this issue should be left up to UE-B implementation, for prefer resource set, we have specified the clear UE-B’s behavior, so there also need specify the clear UE-B’s behavior when receiving the non-preferred resource set. When the requirement of X\*M\_total is not satisfied, it is simple that UE-B backs to S\_A without take the received non-preferred resource set, otherwise, UE-B will increase the RSRP threshold and repeat the process to obtain the more resource, which does’t have benefit on power saving and reliability . |
| Panasonic | Alt 1 | We also accept Alt 2. |
| Vivo | Alt 1 | The alt1 behavior is applied per loop in S\_A identification procedure. The following wording change is proposed.  For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total in step 7),   * It is up to UE-B’s implementation whether/how to take the received non-preferred resource set in its resource selection after step 6) to meet this requirement |
| Samsung | Alt1 modified | Changes in blue not needed.  For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,   * It is up to UE-B’s implementation ~~whether/~~how to ~~take the received non-preferred resource set in its resource selection to~~ meet this requirement |
| OPPO | Alt 2 | “How to take…” in alt 1 seems too broad, it includes taking any resource in the set in any step of resource selection procedure, we prefer not to allow this because we have not assessed it yet.  Alt 2 is fundamental fallback to Rel-16, we believe the performance is acceptable. |

**FL’s observation of 4th email discussion (Condition when Option B can be used for preferred resource set)**

* Support: Fraunhofer, Apple, Qualcomm, Futurewei, CATT, Huawei, OPPO, Fujitsu, Spreadtrum, vivo, InterDigital, Panasonic, (12)
* Not support: Intel, LGE, Samsung, DCM, Ericsson, Sharp, (6)
  + Remove Option 3: Intel, LGE, Samsung, DCM, Ericsson, Sharp, (6)
  + Remove Option 2: Intel, Samsung, Ericsson, Sharp, (4)

Q5-11: Do you agree following updated draft conclusion for condition when Option B can be used for preferred resource set?

Draft proposal 3-17:

For Scheme 1, Option B can be used for preferred resource set when at least one of following condition is met:

* Option 1: UE-B does not have a capability of performing sensing/resource exclusion.
* Option 2: UE-B performs random resource selection.
* Option 3: UE-B has a capability of performing sensing/resource exclusion, but UE-B determines not to perform sensing/resource exclusion by its implementation.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes | All the 3 cases should be considered in the case where UE-B does not have its own sensing results. For Option 1 and 2, the UE should be capable of receiving the IUCs. |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | Yes | For progress, we can accept it even though we prefer to allow option 3 when there is no Rel-16 UE in the same resource pool. |
| NTT DOCOMO | No | As commented, removing Option 3 is essential update. Otherwise, UE-B ignores its surrounding UEs’ reservations. |
| NEC | Yes |  |
| Futurewei | Yes | We support the proposal and are fine with the update “at least” |
| Apple | Yes |  |
| Ericsson | No | Option B makes that UE-B follows blindly the information received in the inter-UE coordination information. We have shown in our contribution with simulation that if a UE is capable of creating its own resource set, i.e., it is capable of sensing, it achieves a better performance by using a combination of its own information and the one received by UE-A. Therefore, we think that only in the case when the UE-B does not have sensing capability Option B shall be used.  We propose to keep only Option 1. |
| Spreadtrum | Yes |  |
| Xiaomi | Yes with comment | For option 1, we think add a clarification to make the proposal more clear.  Option 1: UE-B does not have a capability of performing sensing/resource exclusion, but have a capability of receiving the IUC. |
| Panasonic | Yes |  |
| vivo | Yes |  |
| Samsung | NO | Only Option 1 |
| Sharp | Comment | For the sake of progress we can accept Option 2 and Option 3 if they can be excluded by (pre)configuration. |
| OPPO | yes |  |
|  |  |  |

**FL’s observation of 4th email discussion (Latency bound of inter-UE coordination information)**

* Support: LGE, Qualcomm, Samsung, DCM, Huawei, OPPO, Ericsson, Fujitsu, InterDigital, Panasonic, (10)
* Not support: Futurewei, vivo, xiaomi, (3)
* Comments:
  + No need for conclusion: Intel, CATT, (2)

Q5-12: Do you agree following draft conclusion for latency bound of inter-UE coordination information?

Draft conclusion 3-9:

* For latency bound of inter-UE coordination information transmission, RAN1 relies on RAN2’s decision as per LS R1-2200880 from RAN2

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | No | RAN1 need to check RAN2 solution first before it relies on RAN2 and makes decision  In our view, such conclusion is not needed |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | Yes | We are also fine with that “There is no consensus…”. |
| NTT DOCOMO | Yes |  |
| Futurewei | No | The issue 4 timer may only apply for the IUC triggered by a request. Even with that, it may still have RAN1 impact. Therefore, we prefer to discuss in RAN1 which is more appropriate as most timing requirements/parameters are specified in RAN1. |
| Apple | Yes | We can accept this conclusion for progress. |
| Ericsson | Yes |  |
| xiaomi | no | From our understanding, RAN2 would only define the timer for the delay bound. Issues on how the bound would have impact on resource (re)selection and how the bound is determined can only be discussed in RAN1. Meanwhile, the RAN2 only discuss the timer for request-based inter-UE coordination, but the timer for condition-based inter-UE coordination also need be discussed, so the latency bound need be discussed in RAN 1. |
| Panasonic | Yes |  |
| vivo |  | Fine to withdraw the proposal |
| Samsung | Yes |  |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C)**

* Support: Nokia, Apple, LGE, DCM, OPPO, Fujitsu, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (11)
* Not support: Qualcomm, Futurewei, CATT, Huawei, Ericsson, Sharp, (6)
* Comments:
  + Add “The same TBS should be ensured across (re)transmission(s) of inter-UE coordination information”: Qualcomm, Sharp, (2)

Q5-13: Do you agree following updated draft conclusion on 2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C?

Updated Draft conclusion 3-20:

* No consensus on any restriction on a 2nd SCI format that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C.
  + Note: At least, the same TBS should be ensured between initial transmission and retransmission(s) for the same inter-UE coordination information

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes, with comment | While we are fine with using any 2nd SCI format for retransmissions, we are open to using only SCI format 2-C. If the group cannot converge, we can accept the proposal as a compromise. |
| InterDigital | Yes |  |
| Qualcomm |  | We still prefer to not permit retransmission with SCI 2-C. However, we can accept this as a compromise. |
| LGE | Yes | As we know, TBS is determined by many parameters that can be adjusted. Moreover, since some quantization process is performed for the TBS determination, it would be still possible to use different SCI formats across (re)transmissions of the same TB. There is no reason to have further restriction.  If TX UE cannot find suitable parameters to indicate the same TBS, then it use the same SCI format for its retransmission. Otherwise, it is up to UE implementation.  For a note, since in sidelink, we do not use reserved state of MCS, even though UE successfully decode initial transmission scheduled by a SCI format 2-C, the retransmission also need to explicitly indicate the same TBS by using adjustable parameters. |
| NTT DOCOMO | Yes |  |
| Futurewei | Comment | We are ok with the subbullet included. But we also prefer the updates on the main bullet provided by HW.   * No consensus on ~~any restriction on a~~ 2nd SCI format other than SCI format 2-C that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C.   + Note: At least, the same TBS should be ensured between initial transmission and retransmission(s) for the same inter-UE coordination information * . |
| Apple | Yes | With the newly added note, we are fine with the proposal. |
| Ericsson |  | The conclusion reflects the situation in RAN1. Our position is that only 2-C shall be used for the re-transmission. |
| Spreadtrum | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Comment | While it is true that there is currently no consensus, we would like to point out that re-transmission of SCI Format 2-C with the same information is redundant and degrades air interface capacity when the UE-A receives a NACK. A NACK reception is an indication that pervious SCI Format 2-C has been successfully received. |
| Sharp | OK | Fine to conclude as proposed by FL. It is unclear what “at least” in the note means. We think it can be removed. |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 4th email discussion (Restrictions to the IUC mechanism to address the power saving operation)**

* Support: Fraunhofer, LGE, Qualcomm, Futurewei, Huawei, OPPO, Fujitsu, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (12)
* Not support: Intel, CATT, Ericsson, (3)
* Comments:
  + the intention is not to cancel but rather not to trigger generation: Intel, CATT, (2)
  + Support approach with no RRC impact: Apple, DCM, (2)

Q5-14: Do you agree following updated draft conclusion for restriction(s) to the inter-UE coordination mechanism to address the power saving operation?

Updated Draft conclusion 3-19:

No consensus on ~~RAN1 does not pursue~~ supporting specific enhancement on UE-A’s behavior ~~canceling~~ not triggering inter-UE coordination information ~~transmission~~ generation when the amount of sensing performed by UE-A is below a certain threshold

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | No | UE-B receiving inter-UE feedback should be confident that feedback is reliable and does not hide details of UE-A operation  Unclear how this conclusion helps |
| Fraunhofer | Yes |  |
| InterDigital | Yes |  |
| Qualcomm | Yes with comment | We understand this not to contradict the agreements on leaving the decision whether to transmit inter-UE coordination information up to UE-A’s implementation for both request and condition-based triggering. |
| LGE | Yes | We have the same understanding with QC. |
| NTT DOCOMO | OK |  |
| NEC | Yes |  |
| Futurewei | Yes with comment | We are general fine with the conclusion. However, we are not clear on the updated wording “no consensus”. To us, if not further discussing per “no consensus”, given this is last meeting for R17, it means not pursue supporting specific enhancement… For clarity, we suggest add Rel-17 in the conclusion  No consensus on ~~RAN1 does not pursue~~ supporting specific enhancement in Rel-17 on UE-A’s behavior ~~canceling~~ not triggering inter-UE coordination information ~~transmission~~ generation when the amount of sensing performed by UE-A is below a certain threshold |
| Apple | Yes | We can accept the conclusion for progress. |
| Ericsson | No | We are supportive of including some restriction on UE-A behavior when the amount of sensing performed prior to the creation of the inter-UE coordination message is below a threshold. |
| Spreadtrum | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Yes |  |
| OPPO | yes |  |
| Fujitsu | Yes |  |

**FL’s observation of 3rd email discussion (UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection)**

* Support: Nokia, Apple, LGE, DCM, Futurewei, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, Sharp, xiaomi, InterDigital, Panasonic, Qualcomm (16)
* Not support: vivo, (1)

Q5-15: Do you agree following draft conclusion for UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection?

Draft conclusion 3-18:

No consensus on UE-B’s behavior using the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI as non-preferred resource(s) in its resource selection for unicast/groupcast transmission

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel |  | Not sure it is needed. Can live with it |
| InterDigital | Yes |  |
| Qualcomm |  | Though we prefer to support this behavior, this conclusion reflects the current status in RAN 1 and we accept it. |
| LGE | OK |  |
| NTT DOCOMO | Yes | It seems that this is not related to IUC. |
| NEC | Yes |  |
| Futurewei | Yes | We are ok with the conclusion. |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| vivo |  | If majority think this is not essential, let us withdraw the conclusion |
| Samsung | Yes |  |
| OPPO |  | Fine for progress |
| Fujitsu | Yes |  |

**FL’s observation of 3rd email discussion (conclusion for the reply LS to RAN2)**

* Support: Intel, LGE, DCM, Futurewei, Huawei, OPPO, Ericsson, Fujitsu, xiaomi, InterDigital, (10)
* Not support: Apple, Samsung, (2)

Q5-16: Do you agree following draft conclusion for the reply LS to RAN2?

Draft conclusion 3-21:

* No consensus for RAN1 to send a reply LS of R1-2200880 to RAN2.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | OK |  |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| LGE | OK |  |
| NTT DOCOMO | OK |  |
| NEC | Yes |  |
| Futurewei | Yes | We are fine with this conclusion. |
| Ericsson | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |
| Vivo | Yes |  |
| Samsung | Comment | We can send list of agreements that impact RAN2 especially the MAC CE contents. |
| OPPO | yes |  |
| Fujitsu | Yes |  |

1. **Draft proposals for Monday’s GTW (February 28)**
   1. **Scheme 2**

**FL’s observation of 4th email discussion (for UE-B’s behavior for the received conflict indication for next TB transmission)**

* Alt 1: Intel, CATT, Ericsson, Spreadtrum, InterDigital, (6)
* Alt 1 with modification: Apple, (1)
  + Replace “UE-B’s last SCI for current TB transmission” to “UE-B’s SCI with TRIV=0”: Apple, (1)
* Alt 2: Fraunhofer, Nokia, LGE, Qualcomm, Samsung, Futurewei, Huawei, OPPO, vivo, Sharp, xiaomi, Panasonic, NEC, MediaTek, Fujitsu, ZTE (16)

Draft Proposal 4-1:

Alt 1:

* For UE-B’s periodic transmission in Scheme 2,
  + When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,
    - When UE-B receives a conflict indicator in a PSFCH occasion derived by UE-B’s SCI with TRIV=0 ~~UE-B’s last SCI for current TB transmission~~,
      * PHY layer at UE-B reports resources overlapping with the next earliest reserved resource for next TB transmission to higher layer.
        + If (pre)configured, the PHY layer reports resources in a slot including the next earliest reserved resource for next TB transmission to higher layer.
      * Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.
    - Note: In case of UE-B’s periodic transmission, when UE-B receives a conflict indicator for resource(s) indicated by its SCI with nonzero TRIV, UE-B’s behavior agreed in RAN1#107bis-e meeting is applied
  + When PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI,
    - When UE-B receives a conflict indicator in a PSFCH occasion derived by the reserved resource ~~for next TB transmission~~,
      * PHY layer at UE-B reports resources overlapping with the reserved resource ~~for next TB transmission~~ to higher layer.
        + If (pre)configured, the PHY layer reports resources in a slot including the reserved resource ~~for next TB transmission~~ to higher layer.
      * Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.
  + Note: the existing higher layer parameter of “slotLevelResourceExclusionScheme2” is reused for the (pre)configuration
  + ~~Note: In case of UE-B’s periodic transmission, when UE-B receives a conflict indicator for resource(s) indicated by its SCI for current TB, UE-B’s behavior agreed in RAN1#107bis-e meeting is applied~~

Alt 2 (Note: red-marked part is the change from the previous agreement):

* For Scheme 2,
  + The PHY layer reports S\_A after Step 7) of TS 38.214 Section 8.1.4 to higher layer.
  + When UE-B receives a conflict indicator for resource(s) indicated by its SCI,
    - PHY layer at UE-B reports resources overlapping with the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.
      * If (pre)configured, the PHY layer reports resources in a slot including the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.
    - Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.

**FL’s observation of 4th email discussion (clarification on the meaning of “next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission”)**

* Support: Fraunhofer, Intel, Apple, LGE, Qualcomm, Futurewei, CATT, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, xiaomi, Panasonic, NEC, MediaTek (16)
* Not support: DCM, Sharp, InterDigital, (3)
* Comments:
  + No additional agreement is needed: Samsung, (1)

Draft conclusion 4-2 (Note: it will be discussed after making a decision on Draft Proposal 4-1):

When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,

* if there is a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion”,
  + the PSFCH occasion cannot be used by UE-A for a conflict indication for reserved PSSCH resource other than the earliest reserved PSSCH resource indicated by the corresponding SCI after the PSFCH occasion

**FL’s observation of 4th email discussion (for UE-B determination)**

* Draft proposal 4-3:
  + Support: Fraunhofer, Intel, Nokia, LGE, Qualcomm, DCM, CATT, Huawei, OPPO, Ericsson, xiaomi, InterDigital, Panasonic, NEC, MediaTek (15)
  + Not support: Apple, Samsung, Fujitsu, Spreadtrum, (4)
* Update note (i.e., adding “if it has higher priority value” at the end of the note):
  + Support: Fraunhofer, Intel, Nokia, CATT, OPPO, vivo (6)
  + Not support: LGE, Qualcomm, DCM, Futurewei, Huawei, Ericsson, Fujitsu, Spreadtrum, InterDigital, Panasonic, (10)
* Comments:
  + Add “or pre-emption is disabled in the resource pool” to the note: Nokia, CATT, (2)
  + Add “UE-A does not consider the SCIs received later than “sl-MinTimeGapPSFCH” before the PSFCH occasion when determining UE-B” as a note: Apple, Sparedtrum, (2)
  + Keep the original WA: Samsung, (1)
  + Additional enhancement for UE-B determination in addition to draft proposal 3-2: Futurewei, (1)
  + Consider only UEs satisfying the timeline of PSFCH (i.e., adding a note that if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication satisfies the timeline and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B): Fujitsu, (1)
  + Add “if either of the following conditions is true (1) it has higher priority value and preemption is enabled or (2) pre-emption is disabled in the resource pool” to a note: Intel, (1)

Draft proposal 4-3:

* Confirm the following working assumption with modification in RED. Note that the terminology of “indicationUEB flag” means the indication of whether UE scheduling a conflict TB can be UE-B or not.
  + Working Assumption:
    - For Condition 2-A-1 in Scheme 2, when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is enabled or when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is disabled and the destination UE of the conflicting TBs is UE-A,
      * for each pair of UEs scheduling the conflicting TBs whose PSFCH occasions for resource conflict indication are not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, a UE with the higher priority value is UE-B. When the UEs in the pair have the same priority value, UE-A determines which one of the UEs is UE-B by its implementation.
        + Note: if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication is not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.
        + Note: UE-A considers the SCIs received earlier than or equal to sl-MinTimeGapPSFCH before the PSFCH occasion for conflict indication when determining UE-B.

**FL’s observation of 4th email discussion (conflict indication prioritization rule for overlapping with LTE SL or UL )**

* Support: Intel, Nokia, Apple, LGE, Qualcomm, Samsung, DCM, Futurewei, CATT, Huawei, OPPO, Panasonic, Ericsson, Fujitsu, Spreadtrum, vivo, Sharp, xiaomi, InterDigital, NEC, MediaTek (21)

Draft proposal 4-4:

A UE performs PSFCH TX/RX or TX/TX prioritization between SL HARQ-ACK feedback(s) and resource conflict indication(s) first, and then the UE performs prioritization between prioritized PSFCH TX(s) or RX(s) and LTE SL TX/RX or UL by reusing prioritization rule as specified in TS 38.213 Section 16.2.4.1 and 16.2.4.3.1.

**FL’s observation of 4th email discussion (conflict indication prioritization rule for overlapping with UL containing SL HARQ-ACK information)**

* Support: Intel, Apple, LGE, Qualcomm, Samsung, DCM, Futurewei, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, Sharp, xiaomi, InterDigital, Panasonic, NEC, MediaTek (19)
* Not support: vivo, (1)

Draft conclusion 4-5:

RAN1 does not pursue specific enhancement of Rel-17 inter-UE coordination operation for handling the overlapping between UL with SL-HARQ-ACK information and PSFCH for a conflict indication, i.e., there is no case in Rel-17 where the overlapping between UL with SL-HARQ-ACK information and PSFCH for a conflict indication occur at a UE performing inter-UE coordination operation

**FL’s observation of 4th email discussion (Enhancement on resource selection procedure based on the timeline of a conflict indication)**

* Support: Fraunhofer, Intel, Apple, LGE, Qualcomm, Samsung, DCM, Futurewei, Huawei (w/ removing Note), OPPO (w/ removing Note), Ericsson, Fujitsu, Spreadtrum, vivo, xiaomi (w/ removing Note), InterDigital, Panasonic, NEC, MediaTek (19)
* Not support: CATT, (1)

Updated Draft conclusion 4-6:

RAN1 does not pursue specific enhancement in Rel-17 on Mode 2 resource selection procedure to ensure the timeline (i.e., minimum time gap between PSFCH and a slot where a SCI is transmitted of sl-MinTimeGapPSFCH, minimum time gap between PSFCH and a slot where expected/potential resource conflict occurs on PSSCH resource indicated by a SCI of T\_3) for a conflict indication.

* Note: It does not preclude the possibility for UE-B to perform resource selection satisfying the above timeline by its implementation.
  1. **Scheme 1**

**FL’s observation of 4th email discussion (Whether or not to indicating actual number of resource combination in a SCI format 2-C)**

* Support: Intel, Apple, LGE, CATT, Huawei, OPPO, Spreadtrum, InterDigital, Panasonic, (9)
* Not support: Fraunhofer, Qualcomm, Samsung, DCM, Ericsson, Fujitsu, vivo, Sharp, xiaomi, (9)

Updated Draft conclusion 4-7:

No consensus on indicating actual number of resource combination in a SCI format 2-C for inter-UE coordination information.

* Note : different resource combinations can indicate the same set of resources for the case when only one resource combination is actually used

**FL’s observation of 4th email discussion (Bit field size of MAC CE for inter-UE coordination information when both MAC CE and a SCI format 2-C are used)**

* Support: Apple, LGE, Qualcomm, DCM, Futurewei, CATT, Ericsson, Fujitsu, Spreadtrum, Fujitsu, xiaomi, InterDigital, Panasonic, (13)
* Not support: Samsung, Sharp, (2)
* Comments:
  + Add “Bit field size of “actual number of combinations” on MAC CE may be different from that on SCI format 2-C”: Apple, (1)
  + No need to discuss it: Huawei, (1)
  + Up to RAN2: Samsung, Sharp, (2)

Updated Draft proposal 3-6:

Alt 1:

* For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same bit field size for inter-UE coordination information in a SCI format 2-C is applied to MAC CE except for first resource location(s) from RAN1’s perspective
  + Bit field size of the first resource location(s) on MAC CE is where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information
    - When both SCI format 2-C and MAC CE can be used as the container for inter-UE coordination information, UE does not expect that X is (pre)configured to be smaller than 255
  + Details (e.g., how to put these fields into MAC CE and the related field sizes in MAC CE) are up to RAN2

Alt 2:

* For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same inter-UE coordination information is indicated in the SCI format 2-C and the MAC CE
  + Details (e.g., how to put the fields of SCI format 2C for inter-UE coordination information into MAC CE and the related field sizes in MAC CE) are up to RAN2

**FL’s observation of 4th email discussion (Cast type of inter-UE coordination information transmission triggered by a condition other than explicit request reception)**

* Support: Nokia, Apple, LGE, Qualcomm, DCM, Futurewei, CATT, OPPO, Fujitsu, Spreadtrum, Sharp, xiaomi, InterDigital, Panasonic, (14)
* Not support: Fraunhofer, Intel, Samsung, Huawei, (4)
  + Apply the same principle for the case when it is multiplexed with other data: Fraunhofer, Huawei, (2)
  + Groupcast set can be (pre)configured: Samsung, (1)
  + It is up to RAN2: Huawei, (1)

Updated Draft conclusion 3-12:

* For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,
  + When it is not multiplexed with other data, UE-A determines its cast type by implementation

**FL’s observation of 4th email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A)**

* Alt 1: Fraunhofer, Nokia, LGE, DCM, Ericsson, Panasonic, (6)
* Alt 1 with modification:
  + Remove sub-bullet of Option 1: Intel, Futurewei, (2)
  + Replace “all” with “applicable” in 2nd bullet: Intel, (1)
  + Remove 3rd bullet: Intel, (1)
  + Remove “to be transmitted to the UE-A” in 2nd bullet: Qualcomm, (1)
  + Use the latest IUC for all the cases: Samsung, CATT, (2)
  + Up to UE implementation for 3rd bullet: vivo, Apple, (2)
* Alt 2: LGE, Huawei, InterDigital, (3)

Updated Draft proposal 3-13:

Alt 1:

* For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,
  + Option 1: UE-B uses the latest received preferred resource set from the same UE-A subject to UE processing timeline for its resource selection for a TB to be transmitted to the UE-A.
    - ~~It is up to UE-B's implementation on how to determine the latest received preferred resource set~~
* For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,
  + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A subject to UE processing timeline. UE-B uses the final non-preferred resource set for its resource selection ~~for a TB to be transmitted to the UE-A~~.
* For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,
  + ~~Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.~~
  + It is up to UE-B implementation to use one or multiple of them in its resource (re)selection

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the same UE-A, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

**FL’s observation of 4th email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the different UE-As)**

* Alt 1: LGE, DCM, Ericsson, Panasonic, (4)
* Alt 1 with modification:
  + Remove 2nd bulllet: Fraunhofer, (1)
  + Add “Applicable“ before “received“: Intel, (1)
  + Add “In case of groupcast to the multiple UE-As, UE-B selects resources from the intersection of the received preferred resource sets“: Nokia, CATT, (2)
  + Remove “to these different UE-As providing the non-preferred resource set”: Qualcomm, Samsung, (2)
  + Use each non-preferred resource set for each UE-A: Futurewei, (1)
  + Up to UE implementation for 3rd bullet: Apple, vivo, (2)
* Alt 2: LGE, Huawei, InterDigital, (3)

Draft proposal 3-14:

Alt 1:

* For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,
  + Option 1: UE-B uses each received preferred resource set subject to UE processing timeline for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.
* For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.
  + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As subject to UE processing timeline. UE-B uses the final non-preferred resource set for its resource selection ~~for TB(s) to be transmitted to these different UE-As providing the non-preferred resource sets~~.
* For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,
  + ~~Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.~~
  + it is up to UE-B implementation to use one or multiple of them in its resource (re)selection

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

**FL’s observation of 4th email discussion ((pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set)**

* Support: Fraunhofer, Intel, Apple, LGE, Qualcomm, Samsung, DCM, Futurewei, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, Sharp, xiaomi, InterDigital, Panasonic, (19)
* Comments:
  + Add “T\_1 <= Tproc,1” as note: Intel, LGE, vivo, (3)
  + Remove note: Huawei, (1)

Updated Draft conclusion 3-1:

Not support (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the set of preferred resources in inter-UE coordination information triggered by a condition other than explicit request reception.

* Note that T\_2 is no smaller than T\_2,min and 0<=T\_1 <= Tproc,1 as specified in TS 38.214 section 8.1.4.

**FL’s observation of 4th email discussion (UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured)**

* Support: Intel, Apple, LGE, Qualcomm, Samsung, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, vivo, Sharp, xiaomi, InterDigital, Panasonic, (16)
* Not support: Fraunhofer, Nokia, DCM, Futurewei, (4)
* Comments:
  + Remover sub-bullet: Fraunhofer, Intel, Nokia, DCM, Futurewei, (5)

Updated Draft conclusion 3-11:

In RAN1, no further decision is necessary for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured

* It is up to RAN2 whether/how to additionally handle this case (e.g., defining default priority value)

**FL’s observation of 4th email discussion (Cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used)**

* Support: Intel, LGE, Qualcomm, DCM, CATT, Huawei, OPPO, Spreadtrum, vivo, Sharp, InterDigital, Panasonic, (12)
* Not support: Fraunhofer, Nokia, Samsung, Futurewei, (4)

Updated Draft proposal 3-8:

* For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE only when its cast type is unicast regardless of whether or not it is multiplexed with other data

**FL’s observation of 4th email discussion (Additional criteria on which received preferred non-preferred resource set(s) can be actually taken into account in UE-B’s resource selection)**

* Support: Fraunhofer, LGE, Qualcomm, DCM, Futurewei, Huawei, OPPO, Fujitsu, Spreadtrum, Fujitsu, Sharp, xiaomi, InterDigital, Panasonic, (14)
* Not support: Intel, Ericsson, vivo, (3)
* FFS: Apple, (1)
* Comments:
  + Remove “additional”: Huawei, (1)

Draft conclusion 3-15:

RAN1 does not pursue defining additional criteria on filtering the received preferred or non-preferred resource set(s) to be taken into account in UE-B’s resource selection

**FL’s observation of 4th email discussion (Sensing window for determining the set of resources)**

* Support: Fraunhofer, LGE, Qualcomm, DCM, CATT, OPPO, Fujitsu, Spreadtrum, Sharp, InterDigital, Panasonic, (11)
* Not support: Intel, Futurewei, Huawei, vivo, (4)
* Comments:
  + Add relationship between a resource selection window for determining the set of resources and a resource selection window for transmitting the set of resources: Intel, (1)
  + Clarification on re-evaluation for the set of resources as per Rel-16 procedure: LGE, Qualcomm, OPPO, Ericsson, Spreadtrum, xiaomi, (6)
    - UE-A is required to perform at least one mandatory reevaluation at slot n’-T\_3. It is up to UE-A to perform any extra reevaluation before slot n’-T\_3: Qualcomm, (1)
    - It is up to UE-A to further update the set of resources before it is transmitted: OPPO, (1)
  + Remove last bullet: CATT, vivo, InterDigital, (3)
  + Remove n’ part: Huawei, (1)
  + Replace “n>=n’” with “n>n’”: vivo,

Updated Draft conclusion 3-10:

For sensing window for determining the set of resources in Scheme 1,

* No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A ).
  + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.
  + For inter-UE coordination information triggered by a condition other than explicit request reception, n+T\_1 and n+T\_2 are determined by UE-A’s implementation. ~~With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.~~
* ~~Re-evaluation for the set of resources is supported as per Rel-16 procedures.~~

**FL’s observation of 4th email discussion (Additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total)**

* Support: LGE, Qualcomm, DCM, Futurewei, CATT, OPPO, Huawei, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (12)
* Not support: Fraunhofer, Intel, Nokia, Samsung, Ericsson, (5)
* Comments:
  + Fallback to TX candidate resource set: Intel, LGE, Ericsson, OPPO, xiaomi, (5)
  + Allowing partial overlapping between candidate single-slot resources and non-preferred resources: Nokia, (1)
  + Different preference levels are indicated for non-preferred resources: Samsung, (1)
  + Replace “how to meet this requirement” with “whether or not to use the received non-preferred resource set”: Huawei, (1)
  + Add “to use none or part of the non-preferred resource(s) to meet the requirement of X\*M\_total, when applying all the non-preferred resource(s) cannot meet the requirement of X\*M\_total”: vivo, (1)

Updated Draft proposal 3-16:

Alt 1:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* It is up to UE-B’s implementation whether/how to take the received non-preferred resource set in its resource selection to meet this requirement

Alt 2:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* UE-B does not take the received non-preferred resource set in its resource selection.

**FL’s observation of 4th email discussion (Condition when Option B can be used for preferred resource set)**

* Support: Fraunhofer, Apple, Qualcomm, Futurewei, CATT, Huawei, OPPO, Fujitsu, Spreadtrum, vivo, InterDigital, Panasonic, (12)
* Not support: Intel, LGE, Samsung, DCM, Ericsson, Sharp, (6)
  + Remove Option 3: Intel, LGE, Samsung, DCM, Ericsson, Sharp, (6)
  + Remove Option 2: Intel, Samsung, Ericsson, Sharp, (4)

Draft proposal 3-17:

For Scheme 1, Option B can be used for preferred resource set when at least one of following condition is met:

* Option 1: UE-B does not have a capability of performing sensing/resource exclusion.
* Option 2: UE-B performs random resource selection.
* Option 3: UE-B has a capability of performing sensing/resource exclusion, but UE-B determines not to perform sensing/resource exclusion by its implementation.

**FL’s observation of 4th email discussion (Latency bound of inter-UE coordination information)**

* Support: LGE, Qualcomm, Samsung, DCM, Huawei, OPPO, Ericsson, Fujitsu, InterDigital, Panasonic, (10)
* Not support: Futurewei, vivo, xiaomi, (3)
* Comments:
  + No need for conclusion: Intel, CATT, (2)

Draft conclusion 3-9:

* For latency bound of inter-UE coordination information transmission, RAN1 relies on RAN2’s decision as per LS R1-2200880 from RAN2

**FL’s observation of 4th email discussion (2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C)**

* Support: Nokia, Apple, LGE, DCM, OPPO, Fujitsu, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (11)
* Not support: Qualcomm, Futurewei, CATT, Huawei, Ericsson, Sharp, (6)
* Comments:
  + Add “The same TBS should be ensured across (re)transmission(s) of inter-UE coordination information”: Qualcomm, Sharp, (2)

Updated Draft conclusion 3-20:

* No consensus on any restriction on a 2nd SCI format that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C.
  + Note: At least, the same TBS should be ensured between initial transmission and retransmission(s) for the same inter-UE coordination information

**FL’s observation of 4th email discussion (Restrictions to the IUC mechanism to address the power saving operation)**

* Support: Fraunhofer, LGE, Qualcomm, Futurewei, Huawei, OPPO, Fujitsu, Spreadtrum, vivo, xiaomi, InterDigital, Panasonic, (12)
* Not support: Intel, CATT, Ericsson, (3)
* Comments:
  + the intention is not to cancel but rather not to trigger generation: Intel, CATT, (2)
  + Support approach with no RRC impact: Apple, DCM, (2)

Updated Draft conclusion 3-19:

No consensus on ~~RAN1 does not pursue~~ supporting specific enhancement on UE-A’s behavior ~~canceling~~ not triggering inter-UE coordination information ~~transmission~~ generation when the amount of sensing performed by UE-A is below a certain threshold

**FL’s observation of 3rd email discussion (UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection)**

* Support: Nokia, Apple, LGE, DCM, Futurewei, CATT, Huawei, OPPO, Ericsson, Fujitsu, Spreadtrum, Sharp, xiaomi, InterDigital, Panasonic, (15)
* Not support: Qualcomm, vivo, (2)

Draft conclusion 3-18:

No consensus on UE-B’s behavior using the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI as non-preferred resource(s) in its resource selection for unicast/groupcast transmission

**FL’s observation of 3rd email discussion (conclusion for the reply LS to RAN2)**

* Support: Intel, LGE, DCM, Futurewei, Huawei, OPPO, Ericsson, Fujitsu, xiaomi, InterDigital, (10)
* Not support: Apple, Samsung, (2)

Draft conclusion 3-21:

* No consensus for RAN1 to send a reply LS of R1-2200880 to RAN2.

1. **Draft proposals for Friday’s GTW (February 25)**
   1. **Scheme 1**

**FL’s observation of 3rd email discussion (WA for indicating slot offset for each TRIV)**

* Support: DCM, ZTE, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Huawei, Intel, Apple, Ericsson, Futurewei, Nokia, Qualcomm, Sharp, InterDigital, (20)
* Not support: vivo, Samsung,
* Comments:
  + The slot offset to the first TRIV is 0, and it not signaled: vivo, Samsung,

Updated Draft proposal 3-2:

Confirm the following working assumption with modification in RED

* *Working assumption made in RAN1#107bis-e:*
  + *First resource location of each TRIV is a slot offset with respect to a reference slot*
    - *Alt 2:* 
      * *The slot offset is the number of logical slots from the reference slot*
        + *The value range of slot offsets is from 0 to maximum value that is (pre)configurable up to ~~[~~8000~~256]~~*

*~~FFS: The detailed value range including granularity~~*

* + - * + *Slot offset for each TRIV except for first TRIV to indicate the set of resources is separately indicated by inter-UE coordination information*

*Slot offset for first TRIV is 0*

* + - *For the reference slot,* 
      * *The reference slot is the slot indicated by the inter-UE coordination information in a form of combination of DFN index and slot index*

**FL’s observation of 3rd email discussion (Maximum number of resource combinations in a SCI format 2-C)**

* Support: DCM, LGE, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Intel, Apple, Samsung, Ericsson, Qualcomm, Sharp, InterDigital, (15)
* Not support: OPPO, Fraunhofer, Futurewei, Nokia, (4)
  + Replace “2” with “Y” where Y is the maximum integer that ensures the size of a SCI format 2-C not larger than 140: OPPO, Fraunhofer, Nokia, Qualcomm, (4)
  + Keep 3: Futurewei, (1)

Draft proposal 3-3:

* For following agreement,
  + Replace “[N<=3]” with “N<=2”
  + Replace “[N>3]” with “N>2”
  + Replace “[N=3]” with “N=2”

|  |
| --- |
| ***Agreement made in RAN1#107bis-e:***  *The following working assumption is confirmed with modification in RED.*   * *MAC CE or 2nd SCI are used as the container of inter-UE coordination information transmission from UE A to UE B.*   + - * *For the indication of resource set, the following is supported:*         + *N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.*   *First resource location of each TRIV is separately indicated by the inter-UE coordination information*   * + - * + *If [N <= 3], MAC CE is used and it is up to UE implementation to additionally use 2nd SCI. When 2nd SCI and MAC CE are both used, the same resource set is indicated in the 2nd SCI and the MAC CE. If [N > 3], only MAC CE is used.*   *FFS: UE capability details*  *2nd SCI is UE RX optional*  *The field size of the indication of resource set in a SCI format 2-C is determined by [N=3]* |

**FL’s observation of 3rd email discussion (bit field size of a SCI format 2-C for inter-UE coordination infomration)**

* Support: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Intel, Apple, Ericsson, Nokia, Qualcomm, Sharp, InterDigital, (16)
* Not support: vivo, Huawei, Samsung, Futurewei, (4)
  + The size for first resource location is : vivo, Fraunhofer, Samsung, (3)
  + Add actual number of resource combinations: Huawei, Apple, (2)
  + Remove the lowest subchannel index for the first resource location: Samsung, Futurewei, (2)

Updated Draft proposal 3-4:

* For Scheme 1, each bit field size of a SCI format 2-C for inter-UE coordination information is given by following table:
  + Note that lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information

|  |  |
| --- | --- |
| Field name | Field size (in bits) |
| Providing/requesting indicator | 1 |
| Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel,  with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResoure is configured; otherwise. |
| First resource location(s) |  |
| Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| Resource set type | 1 |
| Lowest subchannel indices for the first resource location of each TRIV | where is provided by the higher layer parameter sl-NumSubchannel |

**FL’s observation of 3rd email discussion (bit field size of a SCI format 2-C for an explicit request)**

* Support: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Huawei, Intel, Samsung, Ericsson, Futurewei, Qualcomm, Sharp, InterDigital, (17)
* Not support: vivo, Nokia, (2)
  + Reduce bit field size of end time of a resource selection window: vivo,
  + Add “resource combination(s)”: Nokia,
* Comments:
  + Add “Note: FFS field related to latency bound of inter-UE coordination information”: Apple,

Draft proposal 3-5:

* For Scheme 1, each bit field size of a SCI format 2-C for an explicit request for inter-UE coordination information is given by following table:

|  |  |
| --- | --- |
| Field name | Field size (in bits) |
| Providing/requesting indicator | 1 |
| Priority | 3 |
| Number of subchannels | Where is provided by the higher layer parameter sl-NumSubchannel |
| Resource reservation period | Where with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResoure is configured; otherwise. |
| Resource selection window location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| Resource set type | 1 bit if determineResourceSetTypeScheme1 is set to ‘UE-B’s request’, otherwise, 0 bit |

**FL’s observation of 3rd email discussion (Bit field size of MAC CE for inter-UE coordination information when both MAC CE and a SCI format 2-C are used)**

* Support: DCM, LGE, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Samsung, Ericsson, Futurewei, Qualcomm, InterDigital, (12)
* Not support: OPPO, Apple, Nokia, (3)
  + Remove sub-bullet: OPPO, Nokia, (2)
  + Add a field to indicate the number of resource combinations: Apple, (1)
* Comment:
  + The size for first resource location is : vivo, (1)
  + Leave MAC CE details up to RAN2: Huawei, Sharp, (2)

Draft proposal 3-6:

* For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same bit field size for inter-UE coordination information in a SCI format 2-C is applied to MAC CE except for first resource location(s)
  + Bit field size of the first resource location(s) on MAC CE is where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information
    - When both SCI format 2-C and MAC CE can be used as the container for inter-UE coordination information, UE does not expect that X is (pre)configured to be smaller than 255

**FL’s observation of 3rd email discussion (Bit field size of MAC CE for an explicit request inter-UE coordination information when only MAC CE is used)**

* Support: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Huawei, Intel, Apple, Ericsson, Futurewei, Nokia, Qualcomm, InterDigital, (18)
* Not support: Samsung, (1)
  + Bit field size for first resource location of first TRIV is 0: Samsung, (1)

Draft proposal 3-7:

* For Scheme 1, when MAC CE only is used as the container of inter-UE coordination information, each bit field size for inter-UE coordination information is given by following table from RAN1’s perspective, and RAN1 understands that the maximum value of N resource combinations to be conveyed in inter-UE coordination information is bounded so that the total payload size of inter-UE coordination information leads not to exceed the size of TB including the MAC CE
  + Details (e.g., whether/how to separately indicate the value of N in the inter-UE coordination information, how to put the following fields into MAC CE and the related field sizes in MAC CE) are up to RAN2

|  |  |
| --- | --- |
| Field name | Field size (in bits) |
| Providing/requesting indicator | 1 |
| Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel,  with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResoure is configured; otherwise. |
| First resource location(s) | Where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information |
| Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| Resource set type | 1 |
| Lowest subchannel indices for the first resource location of each TRIV | Where is provided by the higher layer parameter sl-NumSubchannel. |

**FL’s observation of 3rd email discussion (Cast type of inter-UE coordination information transmission triggered by a condition other than explicit request reception)**

* Support: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Futurewei, Nokia, Qualcomm, Sharp, InterDigital, (14)
* Not support: vivo, Intel, Samsung, (3)

Draft conclusion 3-12:

* For inter-UE coordination information transmission triggered by a condition other than explicit request reception, UE-A determines its cast type by implementation

**FL’s observation of 3rd email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A)**

* Alt 1: DCM, OPPO, Spreadtrum, NEC, xiaomi, Fraunhofer, Intel, Ericsson, Futurewei, Nokia, Qualcomm, (11)
* Alt 2: LGE, Fujitsu, Spreadtrum, Huawei, Sharp, InterDigital, (6)
* Others: vivo, Apple, Samsung, (3)

Draft proposal 3-13:

Alt 1:

* For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,
  + Option 1: UE-B uses the latest received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.
* For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,
  + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A.
* For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,
  + Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the same UE-A, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

**FL’s observation of 3rd email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the different UE-As)**

* Alt 1: DCM, Spreadtrum, NEC, xiaomi, Ericsson, Futurewei, Qualcomm, (7)
* Alt 2: LGE, Fujitsu, Huawei, Sharp, InterDigital, (5)
* Others: vivo, OPPO, Fraunhofer, Apple, Samsung, Nokia, (6)
* Comments:
  + First discuss combinations of cast types for inter-UE coordination information transmissions: Intel, (1)

Draft proposal 3-14:

Alt 1:

* For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,
  + Option 1: UE-B uses each received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.
* For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.
  + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As. UE-B uses the final non-preferred resource set for its resource selection for TB(s) to be transmitted to these different UE-As providing the non-preferred resource sets.
* For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,
  + Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

**FL’s observation of 3rd email discussion ((pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set)**

* Support: DCM, ZTE, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Intel, Apple, Samsung, Futurewei, Nokia, Qualcomm, Sharp, InterDigital, (19)
* Comments:
  + Remove “-T\_1 for determining the set of preferred resources”: Huawei, Futurewei, (2)
  + Remove “Note that”: Intel, (1)

Updated Draft conclusion 3-1:

Not support (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the set of preferred resources in inter-UE coordination information triggered by a condition other than explicit request reception.

* Note that T\_2 is no smaller than T\_2,min as specified in TS 38.214 section 8.1.4.

**FL’s observation of 3rd email discussion (UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured)**

* Support: vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Apple, Samsung, Ericsson, Qualcomm, Sharp, InterDigital, (15)
* Not support: Intel, Futurewei, Nokia, (3)
* Comments:
  + Remove sub-bullet: DCM, Fraunhofer, Intel, (3)

Draft conclusion 3-11:

No further decision is necessary for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured

* It is up to RAN2 whether/how to additionally handle this case

**FL’s observation of 3rd email discussion (Cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used)**

* Support: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, ETRI, Huawei, Intel, Samsung, Qualcomm, Sharp, InterDigital, (14)
* Not support: Fraunhofer, Futurewei, Nokia, (3)
* Comments:
  + Consider possibility of using a SCI format 2-C only: Samsung, (1)

Updated Draft proposal 3-8:

* For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE only when its cast type is unicast regardless of whether or not it is multiplexed with other data

**FL’s observation of 3rd email discussion (Additional criteria on which received preferred non-preferred resource set(s) can be actually taken into account in UE-B’s resource selection)**

* Option 1: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Nokia, Qualcomm, Sharp, InterDigital, (13)
* Option 2: Intel, Apple, (2)
* Option 3:
  + Consider distance between UE-A and UE-B: Ericsson, (1)
  + Option 2 with a specified time gap instead of (pre)configured value: Futurewei, (1)

Draft conclusion 3-15:

RAN1 does not pursue defining additional criteria on filtering the received preferred or non-preferred resource set(s) to be taken into account in UE-B’s resource selection

**FL’s observation of 3rd email discussion (Sensing window for determining the set of resources)**

* Alt 1: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Huawei, Apple, Samsung, Ericsson, Nokia, Qualcomm, Sharp, InterDigital, (18)
* Alt 2: LGE, Intel, Futurewei, (3)
* Comments:
  + Add “Re-evaluation for the set of resources is supported as per Rel-16 procedure”: Huawei, (1)
  + Add “with n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered” for condition-based IUC: Qualcomm,

Updated Draft conclusion 3-10:

For sensing window for determining the set of resources in Scheme 1,

* No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A ).
  + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.
  + For inter-UE coordination information triggered by a condition other than explicit request reception, n+T\_1 and n+T\_2 are determined by UE-A’s implementation. With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.
* Re-evaluation for the set of resources is supported as per Rel-16 procedures.

**FL’s observation of 3rd email discussion (Additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total)**

* Option 1: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Qualcomm, Sharp, InterDigital, (11)
* Option 2:
  + UE-B does not use the received non-preferred resource sets in its resource selection: DCM, OPPO, Intel, (3)
  + UE-B does not used a subset of the received non-preferred resource sets in its resource selection until the requirement is met: Fujitsu, (1)
  + Increasing RSRP threshold: Fraunhofer, (1)
  + Different preference levels are indicated for non-preferred resources: Samsung, (1)
  + It is up to UE-B’s implementation on how to satisfy the requirement of X\*M\_total but UE-B should at least apply the whole slot(s) that is appeared in non-preferred resource set: Futurewei, (1)
  + Allowing partial overlapping with non-preferred resources: Nokia, (1)
* Comments:
  + Discuss draft proposal 3-20, 3-21 first: Huawei, (1)

Draft proposal 3-16:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* It is up to UE-B’s implementation how to meet the requirement

**FL’s observation of 3rd email discussion (Condition when Option B can be used for preferred resource set)**

* Option 1: DCM, vivo, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Franhofer, Huawei, Intel, Samsung, Ericsson, Futurewei, (13)
* Option 2: DCM, vivo, LGE, OPPO, NEC, xiaomi, Franhofer, Huawei, Apple, Futurewei, InterDigital, (11)
* Option 3: vivo, OPPO, NEC, xiaomi, Franhofer, Huawei, Apple, Futurewei, Qualcomm, InterDigital, (10)
* Option 4:
  + UE-B has a capability of performing sensing/resource exclusion, but UE-B is (pre)-configured not to perform sensing/resource exclusion in SL DRX : InterDigital, (1)

Draft proposal 3-17:

For Scheme 1, Option B can be used for preferred resource set when one of following condition is met:

* Option 1: UE-B does not have a capability of performing sensing/resource exclusion.
* Option 2: UE-B performs random resource selection.
* Option 3: UE-B has a capability of performing sensing/resource exclusion, but UE-B determines not to perform sensing/resource exclusion by its implementation.

**FL’s observation of 3rd email discussion (Latency bound of inter-UE coordination information)**

* Support: DCM, LGE, OPPO, Huawei, Samsung, Ericsson, Nokia, Qualcomm, InterDigital, (9)
* Not support: xiaomi, Intel, Futurewei, (3)

Draft conclusion 3-9:

* For latency bound of inter-UE coordination information transmission, RAN1 relies on RAN2’s decision as per LS R1-2200880 from RAN2

**FL’s observation of 3rd email discussion (2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C)**

* Support: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Nokia, (10)
* Not support: Huawei, Intel, Apple, Samsung, Ericsson, Futurewei, Qualcomm, Sharp, (8)
  + Use only SCI format 2-C for the retransmission: Huawei, Intel, Apple, Ericsson, Qualcomm, Sharp, (6)
  + Not use a SCI format 2-C for the retransmission: Samsung, (1)
  + Not support retransmission of inter-UE coordination information: Futurewei, (1)

Draft conclusion 3-20:

* No consensus on any restriction on a 2nd SCI format that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C.

**FL’s observation of 3rd email discussion (Restrictions to the IUC mechanism to address the power saving operation)**

* Support: Intel, Ericsson, (2)
* Not support: vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Samsung, Qualcomm, Sharp, InterDigital, (13)
* Comments:
  + Consider RAN2 impact: Apple, Futurewei, (2)

Draft conclusion 3-19:

RAN1 does not pursue specific enhancement on UE-A’s behavior canceling inter-UE coordination information transmission when the amount of sensing performed by UE-A is below a certain threshold

**FL’s observation of 3rd email discussion (UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection)**

* Support: vivo, OPPO, Spreadtrum, xiaomi, Intel, Nokia, Qualcomm, Sharp , InterDigital, (9)
* Not support: DCM, Fujitsu, NEC, Huawei, Samsung, Ericsson, LGE, (7)
* Comments:
  + Not support the case when a SCI format 1-A is transmitted without PSSCH: LGE, (1)
  + Define similar behavior for unicast and groupcast to target RX UE: Intel, (1)
  + UE-A is the destination UE of the TB to be transmitted by UE-B: Apple, Futurewei, (2)

Draft conclusion 3-18:

No consensus on UE-B’s behavior using the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI as non-preferred resource(s) in its resource selection for unicast/groupcast transmission

* 1. **Others**

**FL’s observation of 3rd email discussion (conclusion for the reply LS to RAN2)**

* Support: DCM, LGE, OPPO, Fujitsu, xiaomi, Huawei, Ericsson, Futurewei, Qualcomm, Sharp, InterDigital, (11)
* Not support: NEC, Intel, (2)

Draft conclusion 3-21:

* No consensus for RAN1 to send a reply LS of R1-2200880 to RAN2.

1. **Draft proposals for 4th email discussion (Due: February 28th 4:59am UTC)**
   1. **Scheme 2**

**FL’s observation of 3rd email discussion (for UE-B’s behavior for the received conflict indication for next TB transmission)**

* Support: LGE, Fujitsu, Fraunhofer, Intel, Samsung, Ericsson, InterDigital, (7)
* Comments:
  + 1st sub-bullet:
    - Clarify that UE-B reports to higher layer “collision” for both aperiodic resource and periodic resource: DCM, (1)
    - Remove “latest”: OPPO, Spreadtrum, Apple, Qualcomm, (4)
    - Remove “for current TB transmission”: OPPO, Spreadtrum, Apple, Qualcomm, (4)
    - Remove “before next reserved resource for next TB transmission”: OPPO, Spreadtrum, Apple, Ericsson, Qualcomm, (5)
    - Add “earliest” before reserved resource: OPPO, Spreadtrum, Apple, Qualcomm, (4)
    - Add “either current TB or” before the next TB transmission: OPPO, Spreadtrum, Apple, Qualcomm, (4)
    - Add “where the next reserved resource is” before for next TB transmission: Samsung, Ericsson, (2)
    - Replace “latest” with “last”: Nokia, (1)
  + 2nd sub-bullet:
    - Remove “earliest”: DCM, ZTE, (2)
    - Remove “for next TB transmission”: ZTE, Apple, (2)
    - Remove 2nd sub-bullet: vivo, (1)
    - Replace “earliest” with “next”: Apple, (1)
  + Other aspects:
    - UE-B reselects reserved resources for next TB transmission when next TB is available: vivo, LGE, xiaomi, (3)
    - Remove “for current TB transmission” in the previous agreement for UE-B’s behavior for the received conflict indication: Huawei, (1)
    - Add “when UE-B has periodic resource reservation”: Apple, (1)
    - Consider at least one of UEs scheduling conflicting TBs is not capable of receiving the conflict indication: Futurewei, (1)
    - Consider UE-B’s SCI missing: Qualcomm, (1)
    - Add “the same RRC parameter as for the first part of the above agreement is used”: Ericsson, (1)

Q4-1: FL understands that there are two interpretations of the agreement for m\_CS when PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted. One is that UE-A can transmit a conflict indication for reserved resource for next TB transmission in PSFCH occasion derived by UE-B’s last SCI for current TB transmission regardless of whether or not the SCI for current TB transmission directly indicates the reserved resource for next TB transmission. The other is that UE-A can transmit a conflict indication for next reserved resource for next TB transmission in PSFCH occasion derived by UE-B’s SCI for current TB transmission only when the next reserved resource indicated by the SCI for current TB transmission is for next TB transmission. **For a formal case, as several companies already commented, UE-A could fail to identify which received SCI is the last SCI for current TB transmission due to SCI missing. This lead to a misalignment between UE-A and UE-B on the next reserved resource for next TB transmission associated with the actual last SCI.** FL prepares two alternatives of UE-B’s behaviour based on different interpretations mentioned above. Company provides which alternative is supported.

Draft Proposal 4-1:

Alt 1:

* For UE-B’s periodic transmission in Scheme 2,
  + When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,
    - When UE-B receives a conflict indicator in a PSFCH occasion derived by UE-B’s last SCI for current TB transmission,
      * PHY layer at UE-B reports resources overlapping with the next earliest reserved resource for next TB transmission to higher layer.
        + If (pre)configured, the PHY layer reports resources in a slot including the next earliest reserved resource for next TB transmission to higher layer.
      * Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.
  + When PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI,
    - When UE-B receives a conflict indicator in a PSFCH occasion derived by the reserved resource for next TB transmission,
      * PHY layer at UE-B reports resources overlapping with the reserved resource for next TB transmission to higher layer.
        + If (pre)configured, the PHY layer reports resources in a slot including the reserved resource for next TB transmission to higher layer.
      * Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.
  + Note: the existing higher layer parameter of “slotLevelResourceExclusionScheme2” is reused for the (pre)configuration
  + Note: In case of UE-B’s periodic transmission, when UE-B receives a conflict indicator for resource(s) indicated by its SCI for current TB, UE-B’s behavior agreed in RAN1#107bis-e meeting is applied

Alt 2 (red-marked part is the change from the previous agreement):

* For Scheme 2,
  + The PHY layer reports S\_A after Step 7) of TS 38.214 Section 8.1.4 to higher layer.
  + When UE-B receives a conflict indicator for resource(s) indicated by its SCI,
    - PHY layer at UE-B reports resources overlapping with the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.
      * If (pre)configured, the PHY layer reports resources in a slot including the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.
    - Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.

|  |  |  |
| --- | --- | --- |
| Company | Alt | Comments |
| Fraunhofer | Alt 2 | We are fine with Alt 2 due to UE-A not being able to identify the last resource reserved for the current TB (or periodic transmission). |
| Intel | Alt.1 |  |
| Nokia, NSB | Alt 2 |  |
| Apple | Alt 1 with modifications | The ambiguity may exist in “UE-B’s last SCI for current TB transmission”. In chained retransmissions where the chain is broken, it is not guaranteed to say which is the last SCI for current TB. We may modify “UE-B’s last SCI for current TB transmission” to “UE-B’s SCI with TRIV=0”, which implies no more reservation of the same TB at the current stage.  We think in Alt 2, “the next reserved resource indicated by the corresponding UE-B’s SCI” may not be very accurate. Consider the case where 1 retransmission of the same TB is supported for periodic transmission. To indicate the potential resource collision of the initial transmission of period 2, if PSFCH occasion corresponds to the initial transmission of period 1, then it may lead to ambiguity whether this indication is for the initial transmission of period 2 or is for the retransmission of period 1. This is shown in the following figure.    To avoid resource collision indication ambiguity, it is better to send PSFCH corresponding to the retransmission of period 1 to indicate the initial transmission of period 2. (Although the SCI for the retransmission of period 1 does not indicate the resource of the initial transmission of period 2, UE-B knows what the next reserved resource is based on its resource selection.) This is shown in the following figure. |
| LGE | Alt 2 | Considering error propagation issue (i.e., SCI for determining a resource conflict and SCI for determining PSFCH resource can be different), we support Alt 2. |
| Qualcomm | Alt 2 | We think that it is beneficial to clarify the meaning of “next reserved resource”. In our understanding, for periodic transmissions both the next resource at slot T+a as well as the periodic reservation for the next TB at slot T+Tperiod is indicated to the upper layer when a conflict indicator is received.  For example, if SPS periodicity is 50 slots and SCI is transmitted at slot 9 and reserves the next re-transmission of the TB at slot 15; then UE-B report both Slot 15 and 59 to upper layer if conflict indicator is received for the reservation at Slot 15. |
| Samsung | Alt 2 |  |
| NTT DOCOMO | Comment | We think Alt 1 has a lot of ambiguous texts.   * For the 1st bullet, UE-B cannot distinguish collision at periodic reserved or that at aperiodic reserved resource from the received collision indication. Then if UE-B reserved from a SCI both periodic resource and aperiodic resource, and when UE-B receives corresponding collision indication, what is the expected behavior? This should be clarified under the 1st bullet. * For the 2nd bullet, periodic reservation/aperiodic reservation does not matter for this option. When collision indication is received for a resource, then the reserved resource is reported to MAC layer. Why do we need “current” “next” for this option? * For the last note, what is the intention of this note? This intends a case where UE-B reserved from a SCI both periodic resource and aperiodic resource? If correct, then the 1st bullet should be restricted by using “ONLY” like, “when the UE-B’s last SCI for current TB transmission reserved only resource for next TB transmission”. In addition, if correct, this note is unnecessary for the 2nd bullet.   In short, we think this discussion/proposal should be handled separately between the options of PSFCH occasion determination. |
| Futurewei | Alt. 2 | We think that alt 2 with updates from previous agreement is sufficient. |
| CATT, GOHIGH | Alt 1 | For alt 1, UE-A can know which SCI transmitted from UE-B will be the potential last SCI, for example, if a SCI has not reserve next reserved resource is deemed as a last SCI. when a UE-A doesn’t detect a such SCI, it can not transmit the conflict indication for next TB.  For alt 2, if retransmission is configured, we don’t know how it can address the resource conflict of initial transmission for periodic transmission. If it can not support resource conflict for initial transmission, this is definitely different from the motivation of the agreement in GTW session. |
| Huawei, HiSilicon | Alt 2 | On the newly made agreement about m\_CS, our understanding is “m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI is 0 regardless the next reserved resource is for current TB transmission or for next TB transmission”. Some examples are given in the Fig 1/2/3 below.  Alt 2 correctly reflects this intention, and is thus supported.  Alt 1 is unclear and has technical issues, thus Alt 1 cannot be agreed in its current form.  Technical issues of Alt 1 are as below:   * As FL already mentioned, how does UE-A know which received SCI is the last SCI for UE-B’s current TB transmission?   + UE-A may miss some SCIs for initial or re-transmissions.   + In addition, it seems some company thinks “TRIV=0 in a SCI” is equivalent to “this SCI is the last SCI for current TB”. However, this is not true!     - Because chain reservation cannot be always guaranteed during the re-transmissions of a TB, i.e., in some re-transmission, UE-B may set TRIV=0 if UE-B cannot find a nearby resource for next retransmission, and UE-B may continue future retransmission using unreserved resource.     - For example, as Fig 3 below shows, it’s possible that TRIV=0 for SCI in A2, but SCI in A10 is the last SCI for current TB.   + In general, the term “last SCI” is very unclear. We suggest proponents of Alt 1 to use more accurate terms (e.g., TRIV=0 or not) to clearly explain their understanding. * *“… the next earliest reserved resource for next TB transmission …”*: this part is also unclear.   + As Fig 3 below shows, if UE-A receives SCI in A10, which resource is “*the next earliest reserved resource for next TB transmission*”? It’s B1 or B10?   + It seems some company thinks B1 is the answer. But how can UE-A knows where B1 is by decoding SCI in A10? Note that UE-A could miss some SCIs for initial/re-retransmission (e.g., may miss SCI in A1), and chain reservation cannot always be guaranteed (e.g., maybe TRIV=0 for SCI in A2).   ==  **Fig 1**    **Fig 2**    **Fig 3** |
| OPPO | Alt 2 | As we commented in the last round, if go with Alt 1, the previous agreement has also to be modified, otherwise, they conflict with each other (as the previous agreement says only report resource for **current** TB to higher layer). |
| Ericsson | Alt 1 |  |
| Spreadtrum | Alt .1 |  |
| Fujitsu | Alt 1 | In our understanding, Alt 1 is the intention of the previous agreement on indicating the conflict of the next TB. For Alt 2, since the last SCI of a current TB does not have to reserve the next TB for the next period, the conflict of the next TB will not be indicated in most cases. |
| Vivo | Alt2 | Alt2 is aligned with the agreement of conflict indication, i.e., the confclit on the next reserved resource will be indicated. |
| Sharp | Alt 2 |  |
| xiaomi | Alt2 | We share the similar view with Fraunhofer, it is more clear and simple. |
| Panasonic | Alt2 | We see alt 2 cannot indicate conflict of initial transmission of next TB when aperiodic transmission is also allocated. However, alt 2 has no issue on SCI missing. So, we support alt 2. |

**FL’s observation of 3rd email discussion (clarification on the meaning of “next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission”)**

* Support: ZTE, vivo, LGE, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Apple, Samsung, Qualcomm, InterDigital, (13)
* Not support: DCM, Intel, Nokia, (3)
* Comments:
  + Delay this discussion after deciding draft proposal 3-1: OPPO, Huawei, (2)
  + Remove “for current TB transmission”: Futurewei, (1)
  + Remove “for receiving a conflict indicator for resource(s) indicated by the SCI”: InterDigital, (1)
  + Do not need to discuss it: Ericsson, (1)

Q4-2: FL understands that based companies’ feedback on the meaning of “next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission” during 3rd email discussion, the point needs to be clarified further is UE-A’s behaviour that if there is a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource after the PSFCH occasion”, whether or not to allow for UE-A to use the PSFCH occasion for a conflict indication for reserved PSSCH resource other than the earliest reserved PSSCH resource after the PSFCH occasion. FL thinks that after having this clarification, no additional clarification is necessary for UE-B’s behavior. Do you agree the following draft conclusion 4-2?

Draft conclusion 4-2:

When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted,

* if there is a PSFCH occasion satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted” but not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource after the PSFCH occasion”,
  + the PSFCH occasion cannot be used by UE-A for a conflict indication for reserved PSSCH resource other than the earliest reserved PSSCH resource after the PSFCH occasion

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes |  |
| Intel | Yes |  |
| Apple | Yes | If our understanding of the proposal is as illustrated as the following figure, we support the proposal. |
| LGE | Yes |  |
| Qualcomm | Yes |  |
| Samsung | No | We think that no more agreements are necessary based on the yellow marked in the previous agreement as  **Agreement**   * When PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI, time gap between the PSFCH and SCI(s) scheduling conflicting TBs is larger than or equal to X value   + - X = *sl-MinTimeGapPSFCH* * UE does not transmit the conflict indicator or receive the conflict indicator if the timeline is not satisfied |
| NTT DOCOMO | No | We think the situation is a bit incorrect. The situation is, there is a PSFCH occasion   * satisfying “the minimum time gap (sl-MinTimeGapPSFCH) between the PSFCH occasion and a slot where the SCI is transmitted”, and * satisfying “the minimum time gap (T\_3) between the PSFCH occasion and **a slot of the reserved PSSCH resource with resource collision** after the PSFCH occasion”, and * not satisfying “the minimum time gap (T\_3) between the PSFCH occasion and a slot of the earliest reserved PSSCH resource after the PSFCH occasion”.   Note that agreed text for T\_3 is the following. Not with the earliest resource. Then why such a new restriction is necessary?  *Time gap between the PSFCH and a slot where expected/potential resource conflict occurs is larger than or equal to T\_3* |
| Futurewei | Yes | We agree. |
| CATT, Yes |  |  |
| Huawei, HiSilicon | Need more clarification | * As commented for proposal 4-1 above, the meaning of “earliest reserved PSSCH resource” is not clear.   + As Fig 3 in our reply for proposal 4-1 (also copied below) shows, if UE-A receives SCI in A10, which resource is “*the next earliest reserved resource for next TB transmission*”? It’s B1 or B10? * We are not clear about the scenario of this conclusion. Does it refer to UE-B transmits single or multiple SCIs to reserve multiple resources? Does the reserved resources refer to current TB, or next TB, or does not matter? * Will it also happen when PSFCH occasion is derived by a slot where expected/potential resource conflict occurs   In general, more clarifications are needed.  **Fig 3** |
| OPPO | Yes | We share the same understanding as Apple illustrated. |
| Ericsson | Yes | We can accept this conclusion. |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Yes | In our understanding, it means that UE-A does not transmit PSFCH, which is aligned with privious agreement |
| Sharp | Comment | We share DCM’s understanding on existing RAN1 agreements. On the other hand, since there was no consensus on indicating the time location of resource conflict we are also fine with what the proposed conclusion says. To avoid confusions, it seems better if RAN1 can update the definition of the timeline in the yellow highlighted bullet below (rather than making the proposed conclusion):   * *RAN1#107-e Agreement:*    + *A resource pool level (pre-)configuration uses either of the following options*     - *Option 1: PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted*       * *Reuse PSSCH-to-PSFCH timing as specified in TS 38.213 Section 16.3 to determine the PSFCH occasion for resource conflict indication*   *Time gap between the PSFCH and a slot where expected/potential resource conflict occurs is larger than or equal to T\_3* |
| xiaomi | Yes |  |
| Panasonic | Yes |  |

**FL’s observation of 3rd email discussion (for UE-B determination)**

* Support: DCM, ZTE, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Apple, Ericsson, Nokia, Qualcomm, InterDigital, (15)
* Not support: Intel, Samsung, Futurewei, (3)
* Comments:
  + Clarify the value of the minimum time gap between PSFCH and a slot where expected/potential resource conflict: vivo, (1)
  + Last note is unnecessary since it is already agreed: xiaomi, Ericsson, (2)
  + Clarify whether/how the last note affect to UE-B’s determination: Huawei, (1)
  + Add “if it has higher priority value” to the 1st note: Intel, (1)
  + Consider at least one of Ues scheduling conflicting TBs is not capable of receiving the conflict indication: Futurewei, (1)

|  |
| --- |
| **FL’s observation of 2nd email discussion:**   * Additional enhancement for UE-B determination in addition to draft proposal 3-2: Apple, Futurewei, Spreadtrum, (3)   + Apple: Further consider a case where both Ues, scheduling the conflict TB, do not have the capability of receiving IUC scheme 2   + Futurewei: If at least one of Ues scheduling conflicting TBs is not capable of receiving the conflict indication, except the Ues not capable of receiving the conflict indication, all other Ues scheduling the conflicting TBs whose PSFCH occasions for resource conflict indication are not yet passed are UE-B   + Spreadtrum: Clarification on “Capable of receiving the conflict indication”. * No additional enhancement for UE-B determination in addition to draft proposal 3-2: DCM, Panasonic, ETRI, LGE, Qualcomm, Sharp, ZTE, Fujitsu, OPPO, Samsung, xiaomi, Ericsson, CATT, Fraunhofer, Huawei, Intel, (16) |

Q4-3: FL observed that companies’ view were divergent on whether or not to keep the last note. FL understands that **the intention of the agreement of “UE does not transmit the conflict indicator or receive the conflict indicator if the timeline is not satisfied” is that UE(s) not satisfying the timeline are finally precluded after applying UE-B determination procedure based on the draft proposal 4-3**. Assuming that the blue-marked part is common understanding, companies provide whether the following updated proposal is supported, including whether or not it is acceptable to add “**if it has higher priority value**” at the end of the note. In the 2nd round of email discussion, FL understands that it is clear that majority companies does not prefer to have additional enhancement for UE-B determination in addition to draft proposal 4-3. So, FL encourages companies to focus on discussing the current draft proposal 4-3 itself.

Draft proposal 4-3:

* Confirm the following working assumption with modification in RED. Note that the terminology of “indicationUEB flag” means the indication of whether UE scheduling a conflict TB can be UE-B or not.
  + Working Assumption:
    - For Condition 2-A-1 in Scheme 2, when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is enabled or when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is disabled and the destination UE of the conflicting TBs is UE-A,
      * for each pair of Ues scheduling the conflicting TBs whose PSFCH occasions for resource conflict indication are not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, a UE with the higher priority value is UE-B.
        + Note: if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication is not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Yes or no | Yes or no for adding “if it has higher priority value” at the end of the note | Comments |
| Fraunhofer | Yes | Yes |  |
| Intel | YES | YES |  |
| Nokia, NSB | Yes | Yes, with comment | Add “if it has higher priority value *or pre-emption is disabled in the resource pool*”  Reason for proposed addition: If pre-emption is disabled, the other UE (e.g., for whom the PSFCH occasion has passed) will not perform pre-emption even if it has higher priority value (e.g., 8), thus the UE for whom the PSFCH occasion has not passed should be UE-B even if it has lower priority value (e.g., 1), in order to protect it from the other UE. |
| Apple | No |  | We still think it is necessary to clarify “PSFCH occasion for resource conflict indication are not yet passed.”  In the example we mentioned in the previous round: UE1’s SCI is sent in slot 1 whose PSFCH occasion is in slot 3 and UE2’s SCI is sent in slot 3 whose PSFCH occasion is in slot 5. Near the end of slot 3, both PSFCH occasions have not been passed. However, due to processing limitation, UE-A may not decode UE2’s SCI before the end of slot 3. Hence, UE2’s SCI is considered when UE-A determines UE-B at the end of slot 3. We need to make this point clear since otherwise, UE-A is mandatory to decode UE2’s SCI before the end of slot 3 when determining UE1 is UE-B or not.  We suggest adding another note to the proposal:  Note: UE-A does not consider the SCIs received later than “*sl-MinTimeGapPSFCH*” before the PSFCH occasion when determining UE-B. |
| LGE | Yes | No | First of all, it seems necessary to clarify that the UE has higher priority value among conflicting TBs.  Next, it seems not consistent with the modified 1st subbullet of the WA. To be specific, if there is a SCI format 1-A with indicationUE flag of 0 and higher priority value, a UE with indicationUE flag of 0 and lower priority value can transmit a conflict indication.  Technically, we see a benefit of reselecting resources of the UE in the note regardless of its priority value. The reselection will help to protect UE-B’s transmission. |
| Qualcomm | Yes | No | In our understanding, it will be beneficial to notify UE-B of a potential collision even if it of a lower priority value. Otherwise, the collision may still happen in the system leading to both the receptions being degraded. |
| Samsung | No |  | We should not change the WA expect if it is clearly broken. We think that the WA is sufficient.  Setting conflict indication based on the timeline or whether the UE supports or doesn’t support conflict feedback leads to the following drawbacks:   * + This could lead to conflicting results with Rel-16 pre-emption leading to wasted resources.   + It disincentives Ues from indicating that they support conflict indication.   Based on the agreement made in the Wednesday GTW, a conflict can happen for a reservation of the next TB. The SCI reserving such a resource for the next TB is sent much earlier than the resource being indicated. This proposal gives an advantage to these resources as the PSFCH occasion for indication would have most likely already past. This can be problematic when the colliding resource has an SCI that is sent later in time and is of higher priority, and potentially with a tighter PDB. |
| NTT DOCOMO | Yes | No | We feel that Apple’s clarification is good. “not yet passed” is ambiguous for spec text.  We do not think “if it has higher priority value” is necessary for the last note. Regardless of priority value, the UE should be UE-B; otherwise, collision cannot be avoided due to UE not supporting scheme 2 and having higher priority value. |
| Futurewei | comment | No | We think we need to consider the case that if at least one of Ues scheduling conflicting TBs has indicationUEB flag is set to 1 or is not capable of receiving the conflict indication. We also need to consider the case of the priority value being the same. Otherwise, we do not have a complete specification on Scheme 2. Therefore, we do not think these cases are for enhancement purpose. At least some conclusions or agreements are needed for these cases.  Since most companies do not want to an independent proposal to consider the case, we then prefer to work on this proposal to cover other necessary scenarios, with updated proposal below.   * + Working Assumption:     - For Condition 2-A-1 in Scheme 2, when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is enabled or when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is disabled and the destination UE of the conflicting TBs is UE-A,       * for each pair of Ues scheduling the conflicting TBs whose PSFCH occasions for resource conflict indication are not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, a UE with the higher priority value is UE-B. If both Ues have the same priority, UE-A selects one UE to be UE-B by implementation.         + Note: if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication is not yet passed ~~and~~ or indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.   Note that in UE feature discussions, for scheme 2 Rx (FG 32-5b-2), almost all companies support the  capability signalling exchange between Ues. So it is not clear then how to determine the UE-B, if one of Ues signaling capable of Scheme 2 Rx but with indicationUEB set to 0. |
| CATT, GOHIGH | Yes | Comment | Regarding whether adding “if it has higher priority value”, we share similar views as Nokia, I,e. “if it has higher priority value *or pre-emption is disabled in the resource pool*” |
| Huawei, HiSilicon | Yes | No | We are generally fine with the proposal.  There is no need to add “if it has higher priority value” at the end of the note.  Because there is only one UE whose PSFCH occasion is not passed and supports being UE-B, so there is no need to compare priorities anymore. Otherwise, it’s possible that no UE will be UE-B, and the collision cannot be avoided. |
| OPPO | Yes | Yes with comments | We think it should be “highest” rather than “higher”, as there may be more than 2 Ues scheduling the conflicting TB.  “**if it has ~~higher~~ highest priority value**” |
| Ericsson | Yes | No |  |
| Spreadtrum | No | No | For the clarification that “PSFCH occasions for resource conflict indication are not yet passed”, We support the comment of Apple. |
| Fujitsu | Comments | No | We think a Note on the timeline is needed. For example, the conflict in the following figure cannot be solved by proposal 4-3 without a timeline note.    In the figure, it is assumed that PSFCH is derived by the slot where UE-B’s SCI is transmitted. For the conflict between PSSCH3 (UE1) and PSSCH5 (UE2), PSFCH2 and PSFCH4 can indicate the conflict to UE1 and UE2 respectively. Since PSFCH2 does not satisfy the timeline, only UE2 can be UE-B. More specifically, UE2 is UE-B no matter whether UE2 has the higher priority value or not. UE-B is determined due to “the timeline is satisfied”, but not due to “the priority is higher” or “PSFCH is not yet passed”. This should be additionally clarified. Actually, another parallel sub-bullet is more preferred as marked by the bule color.   * Note: if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication is not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B. * Note: if there is only one UE scheduling the conflicting TB whose PSFCH occasion for resource conflict indication satisfies the timeline and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B. |
| vivo |  | Yes, Comment | We prefer to remove the whole note, if we add “if it has higher priority value” at the end of the note. |
| Xiaomi | Yes | Yes |  |
| Panasonic | Yes | No | When only one of paired UEs scheduling the conflicting TBs has inter-UE coordination capability, the UE with inter- UE coordination capability should be UE-B regardless of priority value to avoid collision. |

Q4-4: FL understands that main motivation of draft proposal 4-4 is to clarify the executing order of “PSFCH TX/RX or TX/TX prioritization between SL HARQ-ACK feedback(s) and resource conflict indication(s)”. So, the current full sentence is needed. With this understanding, companies provide their views on draft proposal 4-4.

**FL’s observation of 3rd email discussion (conflict indication prioritization rule for overlapping with LTE SL or UL )**

* Support: DCM, ZTE, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Intel, Samsung, Ericsson, Futurewei, Nokia, Qualcomm, InterDigital, (18)
* Not support:
* Comments:
  + Make an agreement instead of a conclusion: Apple, (1)

Draft proposal 4-4:

A UE performs PSFCH TX/RX or TX/TX prioritization between SL HARQ-ACK feedback(s) and resource conflict indication(s) first, and then the UE performs prioritization between prioritized PSFCH TX(s) or RX(s) and LTE SL TX/RX or UL by reusing prioritization rule as specified in TS 38.213 Section 16.2.4.1 and 16.2.4.3.1.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes | Support P#4-4 |
| Nokia, NSB | Yes |  |
| Apple | Yes | We think this proposal should be agreement based on the following reasons:   1. In Rel 16/17 sidelink, we do not have any agreement about prioritization order for the prioritization among PSFCH, the prioritization between NR SL and LTE SL/Uu. Hence, an agreement is necessary, especially considering different prioritization orders will lead to different prioritization results. 2. In the current specification, it is unclear which prioritization order is taken. Actually, our understanding of the current specification is that the prioritization between NR SL and LTE SL is performed before the prioritization among PSFCH. In TS38.213, Section 16.2.4.1, it is mentioned that “If a UE- would transmit a first channel/signal using E-UTRA radio access and second channels/signals using NR radio access, and…” This implies that multiple NR channels could be compared with LTE channel.   Based on the above reasons, we think an agreement is needed here which will have spec. impact. |
| LGE | Yes | This does not always imply that the spec updated is needed. |
| Qualcomm | Yes |  |
| Samsung | Yes |  |
| NTT DOCOMO | Yes | And should be discussed/approved in email reflector since there is no company not supporting this proposal. |
| Futurewei | Yes | We are fine with the proposal although we think the second part “and then…” is not necessary. |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | Yes |  |
| OPPO | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Yes |  |
| Sharp | Yes |  |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-5: FL understands that **the simultaneous mode 1 and 2 operation is not supported from a single UE perspective in Rel-16**. Moreover, RAN1 already agreed that “**For inter-UE coordination operation in Rel-17, RAN1 understands that only UE(s) in mode 2 can be UE-A**”. Companies provide their views on draft conclusion 4-5.

**FL’s observation of 3rd email discussion (conflict indication prioritization rule for overlapping with UL containing SL HARQ-ACK information)**

* Support: DCM, ZTE, LGE, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Intel, Apple, Samsung, Ericsson, Nokia, Qualcomm, InterDigital, (16)
* Not support: vivo, Futurewei, (2)

Draft conclusion 4-5:

RAN1 does not pursue specific enhancement of Rel-17 inter-UE coordination operation for handling the overlapping between UL with SL-HARQ-ACK information and PSFCH for a conflict indication.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes | Only Mode-2 is considered |
| Apple | Yes |  |
| LGE | Yes |  |
| Qualcomm | Yes |  |
| Samsung |  | OK for this but we do not need to spend time for this conclusion. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes with comment | We are fine with the proposal although we are also ok to discuss the prioritization with UL with SL-HARQ-ACK information if a UE can be configured with both modes, e.g. in different pools but slot overlap. |
| CATT, GOHIGH | Yes | No need to involve mode 1. |
| Huawei, HiSilicon | Yes |  |
| OPPO | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | See comment | The discussion point is how to handle the conflict between Rel-17 PSFCH and UL. I wonder why companies says the scenario does not exist. Actually, we cannot preclude co-existence of mode 1 and mode 2 in the same carrier in different resource pools.  For the conclusion 4-5, the consequence of the conclusion is not clear. If there is not enhancement, what would be the UE behavior if Rel-17 PSFCH is conflict with UL containing SL-HARQ, we need some clarification on this point.  Alt.1:UE does not expect overlap between Rel-17 PSFCH and UL containing SL HARQ.  Alt.2: when there is overlap between Rel-17 PSFCH and UL containing SL HARQ, it is up to implementation to prioritize either Rel-17 PSFCH or UL containing SL HARQ.  Alt.3: overlap between Rel-17 PSFCH and UL containing SL HARQ is an error case which is not addressed by specification. |
| Sharp | Yes |  |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-6: Do you agree following updated draft conclusion?

**FL’s observation of 3rd email discussion (Enhancement on resource selection procedure based on the timeline of a conflict indication)**

* Support: DCM, ZTE, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Intel, Samsung, Ericsson, Nokia, Qualcomm, InterDigital, (17)
* Not support: Futurewei, (1)

Updated Draft conclusion 4-6:

RAN1 does not pursue specific enhancement in Rel-17 on Mode 2 resource selection procedure to ensure the timeline (i.e., minimum time gap between PSFCH and a slot where a SCI is transmitted of sl-MinTimeGapPSFCH, minimum time gap between PSFCH and a slot where expected/potential resource conflict occurs on PSSCH resource indicated by a SCI of T\_3) for a conflict indication.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes |  |
| Intel | Yes |  |
| Apple | Yes |  |
| LGE | Yes |  |
| Qualcomm | Yes |  |
| Samsung |  | OK for this but we do not need to spend time for this conclusion. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes | Since majority does not prefer, we are ok with the proposal without the enhancement on the time gap. |
| CATT, GOHIGH | No | We think this is related to how to feedback the conflict indication effectively. If there is no resource selection enhancement to ensure timeline, then the resource conflict can not be feedback. This will degrade the performance of scheme 2, even not useful for scheme 2.  We are concerning going this direction. |
| Huawei, HiSilicon | Yes |  |
| OPPO | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Yes |  |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |

* 1. **Scheme 1**

Q4-7: For the following agreement made in Friday’s GTW session, companies provide their views on whether or not to support defining additional field of “Actual number of resource combination” in SCI format 2-C for inter-UE coordination information?

* *Agreement*
  + *For Scheme 1, each bit field size of a SCI format 2-C for inter-UE coordination information is given by following table:*
    - *Note that lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information*

|  |  |
| --- | --- |
| *Field name* | *Field size (in bits)* |
| *Providing/requesting indicator* | *1* |
| *Resource combination(s)* | *Where is provided by the higher layer parameter sl-NumSubchannel,*  *with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResource is configured; otherwise.* |
| *First resource location(s)* | *8* |
| *Reference slot location* | *Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively.* |
| *Resource set type* | *1* |
| *Lowest subchannel indices for the first resource location of each TRIV* | *where is provided by the higher layer parameter sl-NumSubchannel* |
| *(FFS) Actual number of resource combination* | *1*  *Note: Support of this field is to be concluded by Feb 28.* |

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | No |  |
| Intel | Yes | We are open how to encode this information as a separate field or a codepoint with another field. Information seems needed at least for indication of non-preferred resource set in SCI format 2C |
| Apple | Yes | We think this field is needed to align with MAC CE. In general, we expect that MAC CE has a field of “Actual number of resource combination”.  Also, this 1-bit field is not a big signaling overhead, and the upper bound of 140 bits is still satisfied with this field. |
| LGE | Yes | It would be helpful to have unified design of inter-UE coordination information regardless of a container, and it will be also helpful to reduce RAN2 workload considering very limited timeline. |
| Qualcomm | Comment | The field is needed in MAC-CE, otherwise, the MAC-CE size could be unnecessarily increased.  If the same fields are to be used in both SCI-2C and the MAC-CE, which is not necessary in our view, then this field would also be included in SCI-2C. Our preference is to not include the field in SCI-2C and only include it in the MAC-CE. However, we can accept the field in SCI-2C is RAN1 determines that it is a pre-requisite to including it in the MAC-CE. |
| Samsung | No | This field is not essential. The same functionality can be done without adding this field. |
| NTT DOCOMO | No | The same resource can be indicated when actual number of resource comb. is one. In addition in this case also MAC can indicate only one resource comb. in the same way. We do not see issue on unified design between PHY and MAC. |
| Futurewei | Comments | Although we are not clear the benefit or usage of the bit, we are open to hearing how it will operate with and without this field (or a codepoint). |
| CATT, GOHIGH | Yes | We are open to use a code point of other field, or a separate field. |
| Huawei, HiSilicon | Yes | We assume the question may need some updates. E.g., a question as in red below could be given.  The important thing here is RAN1 needs to clarify how UE-A indicates the actual number of resource combinations? If this is not clarified, the spec might be unclear and RAN1 may need CRs in the maintenance phase.  During the discussions before, we assume there are 3 possible ways mentioned by companies:   * Alt 1: introduce 1 bit field in SCI 2C (as shown in the current proposal) * Alt 2: use an unused codepoint of TRIV in SCI 2C to indicate this resource combination is not used as preferred/non-preferred resources * Alt 3: different resource combinations indicate the same set of resources.   RAN1 needs to discuss and decide on one of the above Alternatives to avoid many CRs later.  Among the above 3 alternatives, we think Alt 1 is more typical and straightforward.  In addition, current size of SCI 2C for IUC is 122 bits. So there should be no problem to include this 1 bit field.  ==  Question: On how UE-A indicates the actual number of resource combinations, which one of the following alternative do you support?   * Alt 1: introduce 1 bit field in SCI 2C (as shown in the current proposal) * Alt 2: use an unused codepoint of TRIV in SCI 2C to indicate this resource combination is not used as preferred/non-preferred resources * Alt 3: different resource combinations indicate the same set of resources. |
| OPPO | Yes |  |
| Ericsson | No | We think that in order to include this functionality a bit is not needed. |
| Spreadtrum | Yes |  |
| Fujitsu | No |  |
| vivo | No | We do not see the motivation to support the field in format 2-C, since many UE implementations have been proposed by companies in GTW discussion.  Whether MAC CE support such field or not is up to RAN2. We do not see the motivation to always align MAC CE field and format 2-C field |
| Sharp | No | Even for MAC CE this is not essential. There are a number of existing MAC CEs indicating “N” entries without the need to indicate the N. |
| xiaomi | No | SCI 2-C does’t need this information field like MAC CE, UE-B just need know the a set of resource indicated by resource combination by decode SCI 2-C. |
| Panasonic | Yes | At least this field is necessary in MAC-CE and same field is indicated by SCI-2C is preferable. |

Q4-8: According to RAN2 LS R1-2200880, RAN2 agreed that “**Inter-UE coordination (IUC) issues (on which) RAN2 mainly relies on RAN1: Information and length of information of IUC MAC CE. The information indicated in RAN1 LS should be taken into account as baseline**”. Also RAN1 already made the following agreements on the bit filed size for MAC CE of explicit request in this meeting. When considering these aspects, FL thinks that there would be no problem for RAN1 to make a recommendation on the bit field size for MAC CE of inter-UE coordination information with FFS point of “Details (e.g., how to put the recommended fields into MAC CE and the related field sizes in MAC CE) are up to RAN2". Do you agree following updated draft proposal?

* *Agreement:*
  + *For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of an explicit request for inter-UE coordination information, the same bit field size for the request in a SCI format 2-C is applied to MAC CE*
* *Agreement:*
  + *For Scheme 1, when MAC CE only is used as the container of an explicit request for inter-UE coordination information, the same bit field size for the request in a SCI format 2-C is applied to MAC CE*

|  |
| --- |
| **FL’s observation of 3rd email discussion (Bit field size of MAC CE for inter-UE coordination information when both MAC CE and a SCI format 2-C are used)**   * Support: DCM, LGE, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Samsung, Ericsson, Futurewei, Qualcomm, InterDigital, (12) * Not support: OPPO, Apple, Nokia, (3)   + Remove sub-bullet: OPPO, Nokia, (2)   + Add a field to indicate the number of resource combinations: Apple, (1) * Comment:   + The size for first resource location is : vivo, (1)   + Leave MAC CE details up to RAN2: Huawei, Sharp, (2) |

Updated Draft proposal 3-6:

* For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same bit field size for inter-UE coordination information in a SCI format 2-C is applied to MAC CE except for first resource location(s) from RAN1’s perspective
  + Bit field size of the first resource location(s) on MAC CE is where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information
    - When both SCI format 2-C and MAC CE can be used as the container for inter-UE coordination information, UE does not expect that X is (pre)configured to be smaller than 255
  + Details (e.g., how to put these fields into MAC CE and the related field sizes in MAC CE) are up to RAN2

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Apple | No | The MAC CE may have the field of “actual number of combinations”, which may have a different size from SCI 2-C. We think this could be another exceptional case, besides the field of first resource location.   * For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same bit field size for inter-UE coordination information in a SCI format 2-C is applied to MAC CE except for first resource location(s) from RAN1’s perspective   + Bit field size of the first resource location(s) on MAC CE is where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information     - When both SCI format 2-C and MAC CE can be used as the container for inter-UE coordination information, UE does not expect that X is (pre)configured to be smaller than 255   + Bit field size of “actual number of combinations” on MAC CE may be different from that on SCI format 2-C.   + Details (e.g., how to put these fields into MAC CE and the related field sizes in MAC CE) are up to RAN2 |
| LGE | Yes | If we consider that container(s) can be different across (re)transmission(s) of inter-UE coordination information, sub-bullet part is essentially needed to ensure having the same TBS between initial transmission and retransmission.  To be specific, if both SCI format 2-C and MAC CE are used for initial transmission of IUC, and if only MAC CE is used for retransmission of IUC, each bit field size of MAC CE should be the same to ensure the same TBS between them.  Even though we support only the same container(s) are used for (re)transmission of inter-UE coordination information, it would be helpful to design MAC CE commonly regardless of whether a SCI format 2-C is used or not. |
| Qualcomm | Yes |  |
| Samsung |  | According to the last discussion, there was no consensus on this issue We are O.K to drop this proposal and to handle in RAN2. It is sufficient to provide RAN2 with the agreements RAN1 has made for the SCI Format 2-C fields and the size of each field. RAN2 can use this bit-size or modify them. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes | We support this proposal |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | See comments | This issue should be closed already given the discussions during last GTW.  For example, as already mentioned by some companies, the following agreement already said “…the same resource set is indicated in the 2nd SCI and the MAC CE …”, so RAN2 should be able to design the MAC-CE given RAN1’s agreements so far.  RAN1 does not need to spend time designing MAC-CE, especially considering RAN1 has so many proposals to be discussed within the next few days.  If companies really want to draw a conclusion here, we suggest the purples changes below:  ==  Updated Draft proposal 3-6:   * For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, ~~the same bit field size for inter-UE coordination information in a SCI format 2-C is applied to MAC CE except for first resource location(s) from RAN1’s perspective~~ the same resource set is indicated in the SCI format 2C and the MAC CE as per RAN1’s previous agreement   + ~~Bit field size of the first resource location(s) on MAC CE is where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information~~      - ~~When both SCI format 2-C and MAC CE can be used as the container for inter-UE coordination information, UE does not expect that X is (pre)configured to be smaller than 255~~   + Details (e.g., how to put ~~these~~ the fields of SCI format 2C into MAC CE and the related field sizes in MAC CE) are up to RAN2   ==  **Agreement**  MAC CE or 2nd SCI are used as the container of inter-UE coordination information transmission from UE A to UE B.   * For the indication of resource set, the following is supported:   + N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.     - First resource location of each TRIV is separately indicated by the inter-UE coordination information   + If N <= 2, MAC CE is used and it is up to UE implementation to additionally use 2nd SCI. When 2nd SCI and MAC CE are both used, the same resource set is indicated in the 2nd SCI and the MAC CE. If N > 2, only MAC CE is used.     - FFS: UE capability details     - 2nd SCI is UE RX optional     - The field size of the indication of resource set in a SCI format 2-C is determined by N=2 |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | See comment | As comment to Q4-7, “actual number of combinations” for SCI format 2-C and for MAC CE may be different. We do not need to force RAN2 to follow format 2-C design regarding “actual number of combinations”. |
| Sharp | No | Same view as Samsung. |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-9: FL understands that as per RAN1 agreement, only unicast can be used for transmission of inter-UE coordination information with preferred resource set even when it is triggered by a condition other than explicit request reception. Also as it was already agreed that inter-UE coordination information can be multiplexed with other data only if the source/destination ID pair is the same, it is clear that the cast type is aligned between inter-UE coordination information and other data when they are multiplexed. One remaining issue is how UE-A determines cast type for transmission of inter-UE coordination information with non-preferred resource set when it is not multiplexed with other data. Do you agree following updated draft conclusion?

|  |
| --- |
| **FL’s observation of 3rd email discussion (Cast type of inter-UE coordination information transmission triggered by a condition other than explicit request reception)**   * Support: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Futurewei, Nokia, Qualcomm, Sharp, InterDigital, (14) * Not support: vivo, Intel, Samsung, (3) |

Updated Draft conclusion 3-12:

* For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,
  + When it is not multiplexed with other data, UE-A determines its cast type by implementation

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Comments | This conclusion is different from what was proposed earlier. We do not see the need to add the additional information on whether it is multiplexed with other data or not in this proposal. We prefer the original wording of the proposal. |
| Intel | Comments | For condition-based standalone feedback transmission (w/o multiplexing with data) the IUC feedback should be available to all UEs.  We do not support leaving it up to UE implementation. |
| Nokia, NSB | Yes |  |
| Apple | Yes |  |
| LGE | Yes | Since we already agreed to support unicast/groupcast/broadcast for inter-UE coordination information with non-preferred resource set triggered by a condition, UE-A choose any cast type by its implementation if the relevant information (e.g. source/destination IDs) are available. |
| Qualcomm | Yes | We prefer this to be broadcast but can accept this to be up to UE implementation for progress. |
| Samsung |  | We think that deciding cast type is not RAN1 scope. Even though our suggestion below has higher layer impact but we think this is the most desirable way to conclude this issue.  So, we suggest the followings:   * + *Groupcast/Broadcast for non-preferred resource set,*      - *A Groupcast set for the transmission of condition-based RSAI* *information to can be (pre-)configured, if not (pre-)configured, the condition-based RSAI information is broadcast to surrounding UEs.*     - *The period of the condition-based RSAI information is (pre-)configured to one of [{100, 500, 1000, 2000}]*   + *Unicast: Only when UE-A has data send to UE-B, and the inter-UE co-ordination information is included in the same SL transmission with the data* |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes | We support this proposal. |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | No | The proposal seems incomplete. What happens “when it is multiplexed with other data”?  In general, RAN1 does not need to discuss whether/how UE-A multiplex data with IUC and the corresponding cast type, these are RAN2 issue. We can fully reply on RAN2 to discuss/decide such things.  We suggest the following red changes (either is ok for us).  Btw: we are also ok with no further discussion/conclusion here, since we assume RAN2 will anyway discuss/decide such things.  ==  Updated Draft conclusion 3-12:   * For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,   + ~~When it is not multiplexed with other data,~~ UE-A determines its cast type by implementation   ==  Updated Draft conclusion 3-12:   * For transmission of inter-UE coordination information with non-preferred resource set triggered by a condition other than explicit request reception,   + ~~When it is not multiplexed with other data,~~ how UE-A determines its cast type ~~by implementation~~ is up to RAN2 |
| OPPO | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Sharp | Yes |  |
| Xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-10: Company provides which alternative is supported for UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A. **FL would like to strongly encourage the proponents of Alt 1 to provide answers on concerns raised up by the proponents of Alt 2 (e.g., see Huawei's concern captured below)**. By doing so, we can efficiently make a decision on this issue in GTW session.

* Alt1, sub-bullet of Option 1:
  + Some companies mentioned the latest one is more accurate and is thus used. But this may not be true. Because it’s possible that a single IUC information (e.g., SCI 2C) cannot include all the preferred resources at UE-A side, so that UE-A may decide to transmit another IUC information to include another set, i.e., the set of preferred resources in different IUCs can be different or even orthogonal. In this case, use the latest one does not make sense.
  + Will RAN1 further consider an earliest and latest bound due to the newly introduced idea of “ … latest received …”, which will even have RRC impact
  + Will UE-B further consider the different priorities of different IUCs from the same UE-A? E.g., assume UE-A1 sends IUC with priority value 1 at slot n, and sends IUC with priority value 8 at slot n+50. The latter IUC is the latest one. However, the former IUC seems to be more important. Which one should UE-B consider?
* Alt 1, sub-bullet of 1st Option 3
  + If UE-B takes union of the non-preferred resources, the remaining resources in S\_A could be very limited, causing RSRP increment and increasing interference. Thus, the performance could be even worse compared with Rel-16.
  + Some previously received non-preferred resource set may be no longer valid and thus should not be considered.
* Alt 1, sub-bullet of 2nd Option 3
  + If the same resource is marked as preferred in one IUC and marked as non-preferred in another IUC, what’s the UE-B’s behavior?

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| **FL’s observation of 3rd email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the same UE-A)**   * Alt 1: DCM, OPPO, Spreadtrum, NEC, xiaomi, Fraunhofer, Intel, Ericsson, Futurewei, Nokia, Qualcomm, (11) * Alt 2: LGE, Fujitsu, Spreadtrum, Huawei, Sharp, InterDigital, (6) * Others: vivo, Apple, Samsung, (3) |

Draft proposal 3-13:

Alt 1:

* For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,
  + Option 1: UE-B uses the latest received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.
    - It is up to UE-B's implementation on how to determine the latest received preferred resource set
* For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,
  + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A.
* For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,
  + Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the same UE-A, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

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| Company | Alt | Comments |
| Fraunhofer | Alt 1 | Both UE-A and UE-B would need these rules defined for mutual understanding of the IUCs being transmitted/received. Hence we do not prefer Alt 2. |
| Intel | Alt.1 with comments | For Alt.1 Option 1   * Remove   + ~~It is up to UE-B's implementation on how to determine the latest received preferred resource set~~ * Replace above with   + RAN1 to finalize what “latest” mean at RAN1#108e   For Alt.1 Option 3   * For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,   + Option 3: UE-B determines a final non-preferred resource set by making union of ~~all~~ applicable the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A.   + RAN1 to finalize meaning of “applicable” at RAN1#108e   The following seems not needed given that exclusion is performed before selection (i.e., such resources are effectively treated as non-preferred) We can discuss whether such resources should be precluded by IUC feedback further   * ~~For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,~~   + ~~Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.~~ |
| Nokia, NSB | Alt 1 |  |
| Apple | Mixed Alt 1 and Alt 2 | For first bullet (preferred resource set) with Option 1, and the third bullet (mixed resource set) with Option 3, we have another question: How does UE-B do if the TB is not sent to UE-A? It seems the solution is not complete. It seems the solution is incomplete.  For second bullet (non-preferred resource set) with Option 3. We think it is needed. If UE-A detects the number of non-preferred resources more than the MAC CE container capacity, UE-A has to send these non-preferred resources in multiple transmissions. A simple way is to take the union of these resources at UE-B.  Regarding HW’s comments   * + If UE-B takes union of the non-preferred resources, the remaining resources in S\_A could be very limited, causing RSRP increment and increasing interference. Thus, the performance could be even worse compared with Rel-16.   We think this is unavoidable if UE-A already detected so many non-preferred resources for UE-B. UE-B has to exclude them in its resource selection procedure. Otherwise, proposal 3-16 addresses the issue.  Regarding HW’s comments   * + Some previously received non-preferred resource set may be no longer valid and thus should not be considered.   We are fine to define the timeline of the gap between multiple IUC transmissions. For example, if the time gap between two IUCs are longer than X slots, then the previously received IUCs are not used. |
| LGE | Either Alt 2 or Alt 1 (without any change) | For progress, we can accept alt 1 without any changes if majority companies support it.  Regarding the determination of the set of resources, as per agreements, they are all independent, and there is no associations between different sets of resources across different inter-UE coordination information transmissions. |
| Qualcomm | Alt 1 with corrections | For condition 1-B-1, in the case of non-preferred set of resource, UE-B should use the inter-UE coordination for a TB to be transmitted to any UE. We propose the following wording change   * For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,   + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB ~~to be transmitted to the UE-A~~.   Without the above change, the working assumption agreed upon during RAN 106bis-e is violated:   * *For Condition 1-B-1 of Scheme 1, the following two options are supported*   + *Option 1: Reserved resource(s) of other UE(s) identified by UE-A whose RSRP measurement is larger than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s)*   + *Option 2: Reserved resource(s) of other UE identified by UE-A whose RSRP measurement is smaller than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s) when UE-A is a destination of a TB transmitted by the UE(s)*   Below, we provide responses to some of the raised concerns.  Comments on Alt 1, sub-bullet of Option 1:   * The case mentioned in the first sub-bullet is not supported by current agreement: if the number of resources in the preferred resource set is greater than a threshold, only MAC CE should be used for inter-UE coordination message. * If UE-A decides to indicate a preferred resource too far away in the future, it may happen that this resource is later reserved by another UE. Thus UE-A will need to update the preferred resource set in a new preferred resource set which excludes the concerned resource. * We do not understand the comment about the RRC impact. Latest mean that the inter-UE coordination message that is received most recently. We’re ok replacing “latest” with “most recent” if that addresses companies concerns. * For the comment on the difference in priority of the inter-UE coordination information. It is our understanding that all inter-UE coordination messages have the same priority from UE-B point of view. Differentiating inter-UE coordination message based on priority level has not been discussed in RAN 1 so far and we do not think it is beneficial to open this discussion at this late stage.   Alt 1, sub-bullet of 1st Option 3:   * We provided simulation results with this option implemented and observed performance gains from inter-UE coordination even for systems with high traffic load * The reason the resource is non-preferred is that it is reserved by another UE. Since there is no mechanism for a UE to un-reserve a reserved resource; a non-preferred resource will not stop being non-preferred at later time.   Alt 1, sub-bullet of 2nd Option 3  When a resource is indicated at both preferred and non-preferred by UE-A, the UE-B will treat this resource as non-preferred. |
| Samsung | Neither | A simple solution is that UE-B uses the latest IUC information it receives from UE-A, whether it is preferred or non-preferred.  It is not clear why UE-B would use any information rather than the latest. |
| NTT DOCOMO | Alt 1 | For the option 1,   * we think “it’s possible that a single IUC information (e.g., SCI 2C) cannot include all the preferred resources at UE-A side, so that UE-A may decide to transmit another IUC information to include another set, i.e., the set of preferred resources in different IUCs can be different or even orthogonal.” is not valid. For more resources, MAC-CE should be used. The motivation of SCI 2C is lower latency, so separate IUCs in SCI 2C are not aligned with the motivation. * We do not understand why this has RRC impact. * We are also OK to consider priority perspective if majority want. But this should not be the reason to object Alt 1.   For the 1st option 3,   * If there are issues on available resource amount and old information, corresponding rule can be proposed. But this should not be the reason to object Alt 1.   For the 2nd Option 3,   * If there is an issue of overlap between preferred and non-preferred, corresponding rule can be proposed. But this should not be the reason to object Alt 1.   In short, if UE-B is allowed to perform any for received IUCs, UE-A does not know the behavior; thus UE-A cannot decide which/when/whether IUC should be transmitted. Without clear answer for this perspective, we do not support Alt 2. |
| Futurewei | Alt 1 with comments | We support Alt 1 in general. For preferred set, it is possible that some available resources were later occupied other UEs. Even with priority value change, the latest would still be most reliable one. It is preferable to use the latest preferred resource set.  For non-preferred set, it is highly probable that the resources occupied by others would be released later before the time passed. Therefore, it is technical sound to use union of the nonpreferred sets.  For the case of both preferred and nonpreferred resource set, if the same resource is marked as preferred in one IUC and marked as non-preferred in another IUC (although we think it is rare if not impossible), following agreed UE-B’s behavior, UE-B will exclude it as it in the nonpreferred resource set and the S\_A sent to MAC will not contain the resource. So the UE-B behavior in existing agreement works fine for this corner case.  We however do not support the newly added subbullet in Alt 1 on UE-B’s implementation how to determine the latest received preferred resource. The latest can be defined the latest one received before UE-B performs resource selection.  We propose the following updated on Alt 1   * For UE-B’s behavior when UE-B receives multiple preferred resource sets from the same UE-A,   + Option 1: UE-B uses the latest received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.     - ~~It is up to UE-B's implementation on how to determine the latest received preferred resource set~~   The latest received preferred resource set is latest one received before UE-B’s resource selection.   * For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,   + Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A. * For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,   + Option 3: UE-B uses both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A. |
| CATT, GOHIGH | Alt 1 with comments | Since the IUC messages are from the same UE, we prefer to reuse the same principle for both preferred resource set and non-preferred resource set, i.e. the latest received IUC message.  From our understanding, the latest received IUC is more important than others, since it reflect the most recent resource occupation status.   * For UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A,   + ~~Option 3: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from the same UE-A. UE-B uses the final non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A.~~   + UE-B uses the latest received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A. |
| Huawei, HiSilicon | Alt2 | The baseline situation for all these cases is that if there is not consensus for another solution, it is left with no specified UE behavior, i.e. up to UE implementation (Alt 2).  Our technical concern on the Options in Alt 1 are not addressed yet, despite multiple rounds of discussion. (Thanks to FL for highlighting them).  If RAN1 does not have enough time to have very careful technical discussions on each of the options under each case, we expect there will be many CRs in maintenance phase to fix the issues we mentioned above or even more issues.  For simplicity, we suggest to take a unified solution to handle all the cases, i.e., Alt2.  In addition, if Alt 2 is taken, Q4-11 can also be quickly resolved using similar solution, which can save a lot of RAN1 time. |
| Ericson | Alt. 1 |  |
| Vivo | Alt.1 | For the 1st bullet, we are fine to use the latest or any received resource set. However, the resource set should match the UE-B’s TB transmission. E.g., resource set#1 is for TB#1, while a later set#2 is for TB#2. for TB#1 transmission, only set#1 can match the TB transmission requirement, which can be used for TB#1 transmission.   * + Option 1: UE-B uses the latest received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.     - For request based IUC, the latest preferred resource set matching the requirement indicated by the request information should be used.   + Option 1’: UE-B uses the ~~latest~~ any received preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.     - For request based IUC, the preferred resource set matching the requirement indicated by the request information should be used.   Regarding the time bound to define the “latest received”, we think RAN2 has already perform the discussion on latency bound. We are fine to further discuss it in RAN1 …  For 2nd bullet, we share with apple that the issue mentioned by Huawei has been discussed by proposal 3-16  For 3rd bullet, UE-B should have flexibility to use either of preferred or non-preferred resource set or both. Especially when UE-B does not performs sensing, UE-B only use the preferred resource set.   * For UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the same UE-A,   + Option 3: it is up to UE-B’s implementation to use preferred resource set, non-preferred resource set, or ~~UE-B uses~~ both the received preferred resource set and non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A. |
| Panasonic | Alt 1 | When UE-A transmits multiple preferred resource set in a different time, the preferred resources are updated in UE-A. UE-B should use the latest received preferred resource set. |

Q4-11: Company provides which alternative is supported for UE-B’s behavior when UE-B receives multiple resource sets from the different UE-As. **FL would like to strongly encourage the proponents of Alt 1 to provide answers on concerns raised up by the proponents of Alt 2 (e.g., see Huawei's concern captured below)**. By doing so, we can efficiently make a decision on this issue in GTW session.

* Alt1, sub-bullet of 1st Option 1:
  + Preferred resources sets from different UE-As may overlap. For example, maybe multiple UE-A indicate the same resource R1 as preferred resource and send it to UE-B. However, UE-B cannot transmit to multiple UE-As on the same resource R1. Then, how does Option 1 work in this case? Will UE-B consider different priorities of different UE-As? Or up to UE-B implementation?
* Alt 1, sub-bullet of 2nd Option 1:
  + As mentioned above, if UE-B takes union of the non-preferred resources, the remaining resources in S\_A could be very limited, causing RSRP increment and increasing interference. Thus, the performance could be even worse compared with Rel-16.
  + If non-preferred resources of different UE-A are due to half-duplex. Then, UE-A1’s half-duplex slot has no relationship with UE-A2’s half-duplex slot. Why UE-B needs to take union of the non-preferred resources.
  + Some previously received non-preferred resource set may be no longer valid and thus should not be considered.
* Alt 1, sub-bullet of Option 2
  + For example, assume UE-A1 indicates R1 as non-preferred due to half-duplex and provides it to UE-B, UE-A2 provides preferred resource to UE-B. Then, when UE-B chooses resource to transmit to UE-A2, why UE-B needs to consider R1? R1 is UE-A1’s non-preferred resource due to half-duplex, and has no relationship with UE-A2.

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| **FL’s observation of 3rd email discussion (UE-B’s behavior when UE-B receives multiple resource sets from the different UE-As)**   * Alt 1: DCM, Spreadtrum, NEC, xiaomi, Ericsson, Futurewei, Qualcomm, (7) * Alt 2: LGE, Fujitsu, Huawei, Sharp, InterDigital, (5) * Others: vivo, OPPO, Fraunhofer, Apple, Samsung, Nokia, (6) * Comments:   + First discuss combinations of cast types for inter-UE coordination information transmissions: Intel, (1) |

Draft proposal 3-14:

Alt 1:

* For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,
  + Option 1: UE-B uses each received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.
* For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.
  + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As. UE-B uses the final non-preferred resource set for its resource selection for TB(s) to be transmitted to these different UE-As providing the non-preferred resource sets.
* For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,
  + Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.

Alt 2:

* When UE-B receives multiple inter-UE coordination information from the different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.

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| Company | Alt | Comments |
| Fraunhofer | Alt 1, with comments | For the second bullet, we do not agree. It is unclear why non-preferred resources from UE-A1 that is diagonally located to UE-A2 would be relevant for the selection of resources for a transmission by UE-B to both UE-As.  Both UE-A and UE-B would need these rules defined for mutual understanding of the IUCs being transmitted/received. Hence, we do not prefer Alt 2. |
| Intel | Alt.1 | Comment #1: We can accept Alt.1 but the definition of the “received” needs to be clarified. The “received” may be a several seconds away. We assume there is no intention to use such feedback.  Comment #2: Change “received” to “applicable received”  Alt 1:   * For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,   + Option 1: UE-B uses each applicable received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set. * For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.   + Option 1: UE-B determines a final non-preferred resource set by making union of all the applicable received non-preferred resource sets from different UE-As. UE-B uses the final non-preferred resource set for its resource selection for TB(s) to be transmitted to these different UE-As providing the non-preferred resource sets. * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + Option 2: UE-B uses both the applicable received preferred resource set and applicable non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the applicable received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set.   We cannot accept Alt.2 as it diminishes all RAN1 efforts to enable IUC framework and cannot be considered as way forward. |
| Nokia, NSB | Alt 1, with comments | Regarding the first bullet of Alt 1, Option 1 works for the case when UE-B has different unicast links with different UE-As. If UE-B requests multiple UE-As to provide IUC information for a single TB, then UE-B should use the intersection of the received multiple preferred resource sets from different UE-As.   * For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,   + Option 1: UE-B uses each received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set.   + In case of groupcast to the multiple UE-As, UE-B selects resources from the intersection of the received preferred resource sets |
| Apple | Mixed Alt 1 and Alt 2 | For first bullet (preferred resource set) with Option 1, and the third bullet (mixed resource set) with Option 2, we have another question: How does UE-B do if the TB is not sent to UE-A? It seems the solution is not complete. It seems the solution is incomplete.  For second bullet (non-preferred resource set) with Option 3. We think it is needed. If UE-A detects the number of non-preferred resources more than the MAC CE container capacity, UE-A has to send these non-preferred resources in multiple transmissions. A simple way is to take the union of these resources at UE-B.  Regarding HW’s comments   * + As mentioned above, if UE-B takes union of the non-preferred resources, the remaining resources in S\_A could be very limited, causing RSRP increment and increasing interference. Thus, the performance could be even worse compared with Rel-16.   We think this is unavoidable if UE-As already detected so many non-preferred resources for UE-B. UE-B has to exclude them in its resource selection procedure. Otherwise, proposal 3-16 addresses the issue.  Regarding HW’s comments   * + Some previously received non-preferred resource set may be no longer valid and thus should not be considered.   We are fine to define the timeline of the gap between multiple IUC transmissions. For example, if the time gap between two IUCs are longer than X slots, then the previously received IUCs are not used. |
| LGE | Either Alt 2 or Alt 1 (without any change) | For progress, we can accept alt 1 without any changes if majority companies support it.  As per agreements, only unicast is supported for inter-UE coordination information transmission with preferred resource set. In this case, UE-B only receives unicast source IDs of different UE-As. On the other hand, UE-B would not know which UE-A(s) are interested in the same groupcast destination ID(s). We prefer not to add description for groupcast case. |
| Qualcomm | Alt 1 with corrections | For condition 1-B-1, in the case of non-preferred set of resource, UE-B should use the inter-UE coordination for a TB to be transmitted to any UE. We propose the following wording change:   * For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.   + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As. UE-B uses the final non-preferred resource set for its resource selection for TB(s) to be transmitted ~~to these different UE-As providing the non-preferred resource sets~~. * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for ~~a TB~~ TB(s) to be transmitted ~~to the UE-A providing the non-preferred resource set~~.   Without the above change, the working assumption agreed upon during RAN 106bis-e is violated:   * *For Condition 1-B-1 of Scheme 1, the following two options are supported*   + *Option 1: Reserved resource(s) of other UE(s) identified by UE-A whose RSRP measurement is larger than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s)*   + *Option 2: Reserved resource(s) of other UE identified by UE-A whose RSRP measurement is smaller than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s) when UE-A is a destination of a TB transmitted by the UE(s)*   Below, we provide responses to some of the raised concerns.  Alt1, sub-bullet of 1st Option 1   * This should be up to implementation. The same scenario happens in Release 16 where a UE needs to select resource to transmit multiple TB at the same time and it is up to UE implementation to determine the resource(s) to be selected for each of the TB-s such that the selected resources are not overlapping in time. Similar approach can be applied here.   Alt1, sub-bullet of 2nd Option 1:   * As noted in Q 4-10, we provided simulation results with this option implemented and observed performance gains from inter-UE coordination even for systems with high traffic load. * In our view in order to address half-duplex issue using condition 1-B-2 there has to be a mechanism to differentiate between non-preferred resource based on condition 1-B-1 and non-preferred resource based on condition 1-B-2. However, such discussion is separate from this proposal. * As noted in Q 4-10, the reason the resource is non-preferred is that it is reserved by another UE. Since there is no mechanism for a UE to un-reserve a reserved resource; there is no reason that a non-preferred resource will stop being non-preferred at later time.   Alt 1, sub-bullet of Option 2  In our view in order to address half-duplex issue using condition 1-B-2 there has to be a mechanism to differentiate between non-preferred resource based on condition 1-B-1 and non-preferred resource based on condition 1-B-2. However, such discussion is separate from this proposal. |
| Samsung | Modified Alt1 | * For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,   + Option 1: UE-B uses each received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set. * For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.   + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As. UE-B uses the final non-preferred resource set for its resource selection for TB(s) to be transmitted to ~~these different UE-As providing the non-preferred resource sets~~ any UE. * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + Option 2: UE-B uses both the received preferred resource set ~~and non-preferred resource set~~ from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. In addition, UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to ~~the UE-A providing the non-preferred resource set~~ any UE.   Alternatively, a simpler solution (which is our first preference), is:  UE-B uses the latest IUC information it receives from each UE-A, whether it is preferred or non-preferred when transmitting to any UE. |
| NTT DOCOMO | Alt 1 | Similar comment for proposal 3-13. |
| Futurewei | Alt-1 with comment | For preferred resource set, we think there shouldn’t be an issue if two preferred resource sets are overlap with each other. If UE-B selects the resource for one UE, it cannot select the resource overlapped with the selected resource to another UE.  For nonpreferred set, since the transmissions are all from the same UE-B, UE-B should select resource to avoid the non-preferred resources from all UE-A’s even the final S\_A is small. If the final S\_A is smaller than the threshold, we have the proposal later for case of one UE-A, which can be applied here too for the union of non-preferred set.  Also for nonpreferred set, if the time already passed, the existing resource exclusion procedure can take care of this as the Rxy will not include these resources.  For the nonpreferred resources resulting from half-duplex, we agree that union may not be efficient. We are open to do discuss this case. Since UE-B does not know which one is from half-duplex, it can only guess that the whole slot which is included in the non-preferred resource set is from half duplex. We are then ok to exclude the whole slot non-preferred resource set for each individual UE. This may have potential risk that the whole slot could be from condition 1-B-1.  So we are fine with the Alt-1 from FL or with some update on the nonpreferred resource set as   * For UE-B’s behaviour when UE-B receives multiple preferred resource sets from the different UE-As,   + Option 1: UE-B uses each received preferred resource set for its resource selection for each TB to be transmitted to each UE-A providing the preferred resource set. * For UE-B’s behaviour when UE-B receives multiple non-preferred resource sets from the different UE-As.   + Option 1: UE-B determines a final non-preferred resource set by making union of all the received non-preferred resource sets from different UE-As except the whole slot non-preferred resources. UE-B uses union of the final non-preferred resource set and each received nonpreferred resource set for its resource selection for TB(s) to be transmitted to ~~these different~~ each UE-A~~s~~ providing the non-preferred resource set~~s~~. * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   + Option 2: UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set. |
| CATT, GOHIGH | Alt 1 with comment | Regarding to the second bullet for non-preferred resource set.  We think this is related to the cast type, if this is for unicast, no need to make union of all the received non-preferred resource sets from different UE-As. |
| Huawei, HiSilicon | Alt2 | Same view as for Q4-10.  The baseline situation for all these cases is that if there is not consensus for another solution, it is left with no specified UE behavior, i.e. up to UE implementation (Alt 2).  Our technical concern on the Options in Alt 1 are not addressed yet, despite multiple rounds of discussion. (Thanks to FL for highlighting them).  If RAN1 does not have enough time to have very careful technical discussions on each of the options under each case, we expect there will be many CRs in maintenance phase to fix the issues we mentioned above or even more issues.  For simplicity, we suggest to take a unified solution to handle all the cases, i.e., Alt2.  In addition, if Alt 2 is taken, Q4-11 can also be quickly resolved using similar solution, which can save a lot of RAN1 time. |
| Ericssson | Alt. 1 |  |
| Vivo | Alt.1 | For 3rd bullet, UE-B should have flexibility to use either of preferred or non-preferred resource set or both. Especially when UE-B does not performs sensing, UE-B only use the preferred resource set.   * For UE-B’s behaviour when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As,   ~~Option 2:~~ it is up to UE-B’s implementation to use preferred resource set, non-preferred resource set, or ~~UE-B uses~~ both the received preferred resource set and non-preferred resource set from different UE-As for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set. UE-B uses the received non-preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the non-preferred resource set. |
| Panasonic | Alt 1 |  |

Q4-12: Do you agree following updated draft conclusion on (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set?

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| **FL’s observation of 3rd email discussion ((pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the preferred resource set)**   * Support: DCM, ZTE, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Intel, Apple, Samsung, Futurewei, Nokia, Qualcomm, Sharp, InterDigital, (19) * Comments:   + Remove “-T\_1 for determining the set of preferred resources”: Huawei, Futurewei, (2)   + Remove “Note that”: Intel, (1) |

Updated Draft conclusion 3-1:

Not support (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the set of preferred resources in inter-UE coordination information triggered by a condition other than explicit request reception.

* Note that T\_2 is no smaller than T\_2,min as specified in TS 38.214 section 8.1.4.

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| Company | Yes or no | Comments |
| Fraunhofer | Yes |  |
| Intel | Yes | We can accept if additional condition is added to the note   * T1 < Tproc,1 |
| Apple | Yes |  |
| LGE | Yes | We are OK with Intel’s suggestion with minor chagne. It is also part of the existing spec.   * T1 <= Tproc,1 |
| Qualcomm | Yes | We support he proposal |
| Samsung |  | OK for this but we do not need to spend time for this conclusion. Also, we think that the note above is not necessary. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes |  |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | Yes | We are generally fine with this proposal.  We suggest to remove the sub-bullet. Because we assume there is no specific reason to highlight T\_2, T\_2,min part. All the following restrictions are specified in Rel-16 (copied from TS 38.214):    * if is shorter than the remaining packet delay budget (in slots) then is up to UE implementation subject to remaining packet delay budget (in slots); otherwise is set to the remaining packet delay budget (in slots).   So RAN1 does not need to have the Note, otherwise it’ll be strange why other restrictions in Rel-16 are not mentioned.  If RAN1 does not have a new agreement to change existing restrictions in current spec, that restriction will be followed by default. This is common understanding, no need to highlight this.  ==  Updated Draft conclusion 3-1:  Not support (pre)configuration of parameters related to n+T\_1 and n+T\_2 for determining the set of preferred resources in inter-UE coordination information triggered by a condition other than explicit request reception.   * ~~Note that T\_2 is no smaller than T\_2,min as specified in TS 38.214 section 8.1.4.~~ |
| OPPO | yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| vivo | Yes | We are fine to set a minimum length for selection window length by using T2\_min.    Note that T\_1 should be determined as specified in TS 38.214 section 8.1.4 |
| Sharp | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-13: Do you agree following updated draft conclusion for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured?

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| **FL’s observation of 3rd email discussion (UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured)**   * Support: vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, ETRI, Huawei, Apple, Samsung, Ericsson, Qualcomm, Sharp, InterDigital, (15) * Not support: Intel, Futurewei, Nokia, (3) * Comments:   + Remove sub-bullet: DCM, Fraunhofer, Intel, (3) |

Updated Draft conclusion 3-11:

In RAN1, no further decision is necessary for UE-A’s behavior of determining a priority value of inter-UE coordination information transmission triggered by a condition other than explicit request reception if the priority value is not (pre)configured

* It is up to RAN2 whether/how to additionally handle this case (e.g., defining default priority value)

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| Company | Yes or no | Comments |
| Fraunhofer | Comment | We are fine with the main bullet, and prefer that the priority value be left up to UE implementation. |
| Intel | Yes | Prefer to remove sub-bullet |
| Nokia, NSB | No | A decision is necessary – and this aspect should be specified in the standard. If the prioritization is left up to UE-A implementation, this leaves the door open for UE-As to abuse their freedom by setting the highest priority to their IUC transmissions, and in so doing unfairly promote their own data transmissions when multiplexed with the IUC.  Our preference is Option 5: *The priority value is the same as the priority value indicated by other UE’s SCI that is used to determine the non-preferred resource set*. |
| Apple | Yes | We are also fine with the removal of the sub-bullet. |
| LGE | Yes | If network does not want to have unexpected setting, network can (pre)configure its priority value. |
| Qualcomm | Yes |  |
| Samsung | Yes | BTW, do we need to have this conclusion?  We think that we do not need to spend time for this conclusion. |
| NTT DOCOMO | No | Remove the sub-bullet. |
| Futurewei | Comment | We prefer to include the option with the priority value determined by UE implementation if the priority is not preconfigured. We do not support the subbullet which leave the discussion to RAN2. |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | Yes | Although our 1st preference is leaving it to UE-A implementation, we can live with this for the sake of progress. |
| OPPO | yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Yes |  |
| Sharp | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-14: RAN1 already agreed that SCI format 2-C is UE RX optional. FL understands that in the case of GC/BC, it would be difficult for a UE transmitting inter-UE coordination information using SCI format 2-C to know whether or not target receiver(s) have the capability of SCI format 2-C reception. Note that in the Rel-17 UE feature discussion, the singling exchange of capability of SCI format 2-C reception between UEs was agreed, and RAN2 will work on the design of higher layer signaling (e.g., PC5 RRC) for this purpose in case of UC. Do you agree following updated draft conclusion for cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used?

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| **FL’s observation of 3rd email discussion (Cast type of inter-UE coordination information when both a SCI format 2-C and MAC CE are used)**   * Support: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, ETRI, Huawei, Intel, Samsung, Qualcomm, Sharp, InterDigital, (14) * Not support: Fraunhofer, Futurewei, Nokia, (3) * Comments:   + Consider possibility of using a SCI format 2-C only: Samsung, (1) |

Updated Draft proposal 3-8:

* For inter-UE coordination information transmission, a SCI format 2-C can be used in addition to MAC CE only when its cast type is unicast regardless of whether or not it is multiplexed with other data

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| Company | Yes or no | Comments |
| Fraunhofer | No | As mentioned by Nokia and Futurewei in the previous rounds, if the destination ID can be a groupcast ID, we do not see the need to restrict the use of SCI 2-C to unicast alone, and can support groupcast. |
| Intel | Yes | For the sake of progress and simplicity |
| Nokia, NSB | No | Broadcast can be supported by setting Destination ID to a broadcast identity. Likewise, groupcast can be supported when HARQ feedback is not requested, by setting Destination ID to a groupcast ID.  There may be cases where broadcasting SCI 2-C is beneficial given its lower latency. For example, if UE-A has some non-preferred resource(s) in the very near future due to Condition 1-B-1 Option 2, then, due to latency, SCI format 2-C may be the only option to make surrounding UEs aware of those non-preferred resource(s). If UE-A now broadcasts these non-preferred resource(s) using SCI format 2-C, of course some surrounding UEs won't be able to decode it - but that is a better outcome than not being able to inform any surrounding UEs except those with which UE-A currently has a unicast link.  Moreover, if SCI 2-C is constrained to unicast, but UE-A has groupcast or broadcast data to transmit, UE-A won’t be able to multiplex/piggyback the SCI 2-C with the groupcast/broadcast data, which would be more efficient. |
| LGE | Yes | In our understanding, some similar discussion was made in Rel-16. To be specific, this issue was about L1 destination ID is sufficient to distinguish cast type. In RAN1 perspective, it was important to decide whether or not to introduce HARQ-ACK feedback option indication in 2nd SCI format. As we know, the result was to add cast type indicator.  In this point of view, destination ID would not be sufficient to distinguish cast type in MAC layer, so, similar approach should be adopted. In short, we need to tie some cast type with a SCI format 2-C without cast type indicator. |
| Qualcomm | Yes |  |
| Samsung | No | It is not clear ‘in addition to MAC CE’. What is the UE behavior whether for UE to use MAC CE or 2nd SCI?  When coordination message or coordination request is multiplexed with data, it would be beneficial to use the 2nd SCI for RSAI request rather than MAC CE in the latency aspect. Therefore, we propose:  *When a resource pool level configuration enables that MAC CE or 2nd SCI are used as the container for RSAI message,*   * *If N<= 3 and RSAI is multiplexed with data, only 2nd SCI is used for container.* * *Otherwise, only MAC-CE is used for container.*   *When a resource pool level configuration enables that MAC CE and 2nd SCI are used as the container for RSAI request,*   * *If RSAI request is multiplexed with data, only 2nd SCI is used for container,*   *Otherwise, only MAC-CE is used for container.* |
| NTT DOCOMO | Yes |  |
| Futurewei | No | We do not see any necessities to restrict it to unicast only, while groupcast can be supported. |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | Yes | We share similar view with FL. |
| OPPO | yes |  |
| Spreadtrum | Yes |  |
| Vivo | Yes |  |
| Sharp | Yes |  |
| Panasonic | Yes |  |

Q4-15: Do you agree following draft conclusion for additional criteria on which received preferred non-preferred resource set(s) are taken into account in UE-B’s resource selection?

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| **FL’s observation of 3rd email discussion (Additional criteria on which received preferred non-preferred resource set(s) can be actually taken into account in UE-B’s resource selection)**   * Option 1: DCM, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Nokia, Qualcomm, Sharp, InterDigital, (13) * Option 2: Intel, Apple, (2) * Option 3:   + Consider distance between UE-A and UE-B: Ericsson, (1)   + Option 2 with a specified time gap instead of (pre)configured value: Futurewei, (1) |

Draft conclusion 3-15:

RAN1 does not pursue defining additional criteria on filtering the received preferred or non-preferred resource set(s) to be taken into account in UE-B’s resource selection

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| Company | Yes or no | Comments |
| Fraunhofer | Yes, with comment | While we understand the benefit of considering the distance between UE-A and UE-B (as suggested by Ericsson), at this point in time, we prefer to go with the FL’s proposal. |
| Intel | No | In this case it is unclear whether/how to handle feedback from different UEs and different types of feedback, including feedback generated with different parameters comparing to the ones used by TX UE |
| Apple | Comments | Maybe we do not need any conclusion at this moment. If in maintenance phase, companies think some additional criteria is necessary, we could still discuss them. |
| LGE | Yes |  |
| Qualcomm | Yes |  |
| Samsung |  | We think that we do not need to spend time for this conclusion. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes | We can accept the proposal although we feel a certain timing gap is needed. |
| CATT, GOHIGH | Comment | At least, how to identify the which UE is the effect UE-A should be discussed. |
| Huawei, HiSilicon | See comments | So far, RAN1 has not agreed any filtering mechanism, right?  So “additional” should be removed.  The term “filtering” is not defined yet, the meaning might be unclear and cause confusion. A more accurate term is appreciated.  ==  Draft conclusion 3-15:  RAN1 does not pursue defining ~~additional~~ criteria on filtering the received preferred or non-preferred resource set(s) to be taken into account in UE-B’s resource selection |
| OPPO | yes |  |
| Ericsson | No | We think that some sort of filtering is needed in order to avoid having too much unnecessary signalling. |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Comment | We tend to agree with Intel |
| Sharp | Yes |  |
| xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-16: Do you agree following updated draft conclusion for sensing window for determining the set of resources? Note that the updated parts of Alt1 are marked with red.

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| **FL’s observation of 3rd email discussion (Sensing window for determining the set of resources)**   * Alt 1: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, ETRI, Huawei, Apple, Samsung, Ericsson, Nokia, Qualcomm, Sharp, InterDigital, (18) * Alt 2: LGE, Intel, Futurewei, (3) * Comments:   + Add “Re-evaluation for the set of resources is supported as per Rel-16 procedure”: Huawei, (1)   + Add “with n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered” for condition-based IUC: Qualcomm, |

Updated Draft conclusion 3-10:

For sensing window for determining the set of resources in Scheme 1,

* No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A ).
  + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.
  + For inter-UE coordination information triggered by a condition other than explicit request reception, n+T\_1 and n+T\_2 are determined by UE-A’s implementation. With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.
* Re-evaluation for the set of resources is supported as per Rel-16 procedures.

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| Company | Yes or no | Comments |
| Fraunhofer | Yes |  |
| Intel | No | Proposed revision:   * ~~For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.~~ * If inter-UE coordination information is triggered by an explicit request,   + (n+T\_1) ≤ (n'+T’\_1)   + (n'+T’\_2) ≤ (n+T\_2)   where   * + - (n+T\_1) – Start slot of resource selection window for determining the set of resources     - (n+T\_2) – End slot of resource selection window for determining the set of resources     - (n’+T’\_1) – Start slot of resource selection window used for inter-UE coordination information transmission     - (n’+T’\_2) – End slot of resource selection window used for inter-UE coordination information transmission |
| Apple | Comments | We have a clarification question on the proposal.  If UE-A have the resource selection window of (n+T1, n+T2) as in explicit request, and its sensing window is defined by (n+T1-T\_0-T\_{proc,1}, n+T1-T\_{proc,0}-T\_{proc,1}), then UE-A determines the contents of IUC at slot n.  Then what is UE-A’s resource selection window for IUC transmission? We think it has to be later than slot n, but earlier than the first indicated resources in IUC (since otherwise, the IUC information is outdated). Do we need to agree on the restriction of the resource selection window (or PDB) for IUC transmission? |
| LGE | Yes with comment | It seems necessary to clarify the meaning of the last sub-bullet.  As we know, re-evaluation is performed before the UE transmit the selected resource(s).  Now, since it is about determining the set of resources, there are two possibilities. One is that UE-A can perform re-evaluation for the set of resources until the earliest timing of the set of resources. The other is that UE-A can perform re-evaluation for the set of resources until its inter-UE coordination information transmission. |
| Qualcomm | Yes, with comments | Regarding the last bullet, we think that the meaning is a bit unclear. In Rel-16 a mandatory re-evaluation is performed at least in slot m-T\_3 where m is the slot of TB transmission. It is up to UE to perform any extra reevaluation before m-T\_3. We think the same principle can be applied here.  We propose the following wording:   * Re-evaluation for the set of resources is supported as per Rel-16 procedures.   + UE-A is required to perform at least one mandatory reevaluation at slot n’-T\_3. It is up to UE-A to perform any extra reevaluation before slot n’-T\_3. |
| Samsung |  | BTW, do we need to have this conclusion?  We think that we do not need to spend time for this conclusion. |
| NTT DOCOMO | Yes | Tend to agree with LGE. The last bullet is ambiguous. |
| Futurewei | No | For IUC triggered by explicit request, UE-B does not wait after n+T1-Tproc,1 to perform resource selection as we have agreed that UE-A may not transmit coordination information per the following agreement.  **Agreement**  For inter-UE coordination triggered by an explicit request in Scheme 1, whether or not to transmit the inter-UE coordination information upon the request reception is determined by UE-A’s implementation subject to the following procedures.   * Rel-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control   Therefore, we think the sensing ending time should be specified consider the resource selection (RSW) at UE-A and UE-B’s resource selection time and behaviour.  For explicit request IUC, the deadline for UE-B receiving coordination information is (n+T1)-Tproc,1-1, where 1 slot included is for transmission propagation and decoding of coordination information.  Since UE-A needs to select the resource for coordination, therefore additional timing gap Tr needed. So sensing should be ended by (n+T1)-Tproc,1-1 -Tr-Tproc,0. We can set Tr = T2min or larger which includes T1 timing per R16 definition.  Therefore, we propose change sensing ending time as (n+T\_1) - T\_proc,0 – T\_proc,1-Tr-1, where Tr can be T2min or larger than T2min. The sensing window also applies to the IUC triggered by condition where n+T\_1 is determined by UE-A’s implementation. |
| CATT, GOHIGH | Yes with comments | We are generally fine with the proposal, but think some clarification is necessary.  First, the sensing window range “(n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1” need to further clarify. The T\_1 in “n+T\_1” should be different from T\_1 determined by UE-A. we suggest to change n+T\_1 to n1, and n+T\_2 to n2.  Second, we are not fully convinced the new added last bullet, it is unclear what’s the checking timing of re-evaluation, does it need to update the IUC message after re-evaluation? If yes, it is different from that of Rel-16, which doesn’t to reconstruct the TB. |
| Huawei, HiSilicon | See comments | On the last sub-bullet of re-evaluation: we support it. Same behavior as per Rel-16 procedures is followed.  Btw: the last sub-bullet refers to “UE-A performs re-evaluation for the set of resources before IUC transmitting” (same as Rel-16 re-evaluation). Because after IUC is transmitted, the contents of MAC-CE cannot be changed due to HARQ combining, so there is no need to update the set of resources.  For “With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered” part: we are unclear why this is needed. In this case, inter-UE coordination information generation is triggered by UE-A’s implementation (i.e., n’ is determined by UE-A implementation), and n+T\_1 and n+T\_2 are also determined by UE-A’s implementation. Therefore, the newly added red part is already covered by the sentence before it, so it’s not necessary.  ==  Updated Draft conclusion 3-10:  For sensing window for determining the set of resources in Scheme 1,   * No further change is supported. Note that the sensing window for determining the set of resources is already derived based on the location n+T\_1 and n+T\_2 used for determining the set of resources in TS38.214 section 8.1.4, i.e., sensing window is defined by the range of slots [ (n+T\_1) - T\_0 - T\_1 determined by UE-A, (n+T\_1) - T\_proc,0 - T\_1 determined by UE-A ).   + For inter-UE coordination information triggered by UE-B’s explicit request, n+T\_1 and n+T\_2 are provided by the request.   + For inter-UE coordination information triggered by a condition other than explicit request reception, n+T\_1 and n+T\_2 are determined by UE-A’s implementation. ~~With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.~~ * Re-evaluation for the set of resources is supported as per Rel-16 procedures. |
| OPPO | Yes with comments | For the last bullet, we support the intention behind, but re-evaluation defined in Rel-16 is for the resources selected for transmission, not for the contents to be transmitted. How about the following:   * It is up to UE-A to further update ~~Re-evaluation for~~ the set of resources before it is transmitted ~~is supported as per Rel-16 procedures~~. |
| Ericssson | Comment | We need more clarification in the last bullet. Is the intention that a UE will perform re-evaluation/pre-emption of the resources included in the IUC message? |
| Spreadtrum | Yes with comment | The mechanism of the last sub-bullet needs to be clarified. It is not clear which UE will perform re-evaluation. If UE-A, is it means that UE-A will transmit a new resource set to UE-B for supporting this mechanism? If UE-B, how to guarantee it can support sensing procedure? |
| Fujitsu | Yes |  |
| Vivo | No for the red colored statement | We think slot n for preferred resource selection should be located after IUC transmission slot, thus re-evaluation for the preferred resource is not needed, since IUC has informed the preferred resource already.  ~~With n>= n’, where n’ is the slot in which inter-UE coordination information generation is triggered.~~  With n> n’, where n’ is the slot where IUC is transmitted.  ~~Re-evaluation for the set of resources is supported as per Rel-16 procedures~~ |
| Sharp | Yes |  |
| xiaomi | comment | For the last bullet, we think the re-evaluation is performed at UE-B other than UE-A, this need be clarified. |
| Panasonic | Yes |  |

Q4-17: Do you agree following draft conclusion for additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total?

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| **FL’s observation of 3rd email discussion (Additional UE-B behavior to handle the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total)**   * Option 1: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Qualcomm, Sharp, InterDigital, (11) * Option 2:   + UE-B does not use the received non-preferred resource sets in its resource selection: DCM, OPPO, Intel, (3)   + UE-B does not used a subset of the received non-preferred resource sets in its resource selection until the requirement is met: Fujitsu, (1)   + Increasing RSRP threshold: Fraunhofer, (1)   + Different preference levels are indicated for non-preferred resources: Samsung, (1)   + It is up to UE-B’s implementation on how to satisfy the requirement of X\*M\_total but UE-B should at least apply the whole slot(s) that is appeared in non-preferred resource set: Futurewei, (1)   + Allowing partial overlapping with non-preferred resources: Nokia, (1) * Comments:   + Discuss draft proposal 3-20, 3-21 first: Huawei, (1) |

Draft proposal 3-16:

For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,

* It is up to UE-B’s implementation how to meet this requirement

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| Company | Yes or no | Comments |
| Fraunhofer | Comment | We do not think UE-B discarding the non-preferred resource set is ideal because UE-B would be then including resources where collisions are possible to its candidate resource set. We are fine with UE-B increasing the threshold and repeating the process, as described in the current specifications (step 7).  If the group cannot converge, we can accept the proposal as a compromise. |
| Intel | NO | As a simple solution we propose to fallback to TX candidate resource set |
| Nokia, NSB | No | We don’t think this issue should be left up to UE-B implementation. The infinite loop issue needs to be addressed by the specification.  We suggest to relax UE-B’s resource exclusion by **increasing the allowed overlap in Step 7**. When evaluating whether or not to exclude a candidate single-slot resource that overlaps with non-preferred resource(s), the allowed overlap (initially 0%) may be successively increased (e.g., first to 10%, then to 20%, and so on) in Step 7. A candidate single-slot resource is only excluded if its overlap with non-preferred resource(s) is greater than the allowed overap. In this way, the infinite loop issue can be resolved.  *7) If the number of candidate single-slot resources remaining in the set is smaller than , then is increased by 3 dB for each priority value* ***and allowedOverlapNonPreferredResources is increased by [Y] percentage points [alternatively, increased by Z subchannels]*** *and the procedure continues with step 4.* |
| LGE | Yes | We are also fine with fallbacking to S\_A determined by UE-B’s sensing results. |
| Qualcomm | Yes |  |
| Samsung | No | Different preference levels are indicated for the non-preferred resources. If there isn’t enough candidate resources, the levels corresponding to the least of the non-preferred resources is not excluded. |
| NTT DOCOMO | OK | Or we are fine with some rule. |
| Futurewei | Yes with Comment | We think it is similar to the infinite loop scenario, so we may clarify the case which happens after repeating the process with RSRP increasing. Second although it is up to UE-B’s implementation, we may need to clarify that it is allowed that some non-preferred resources are not excluded. The updated proposal is  For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total with the repeating processed with RSRP increasing,   * It is up to UE-B’s implementation how to meet this requirement. It is allowed that some resources in nonpreferred resource set are not excluded. |
| CATT, GOHIGH | Yes | We can accept this proposal if group can not converge. |
| Huawei, HiSilicon | No | The sub-bullet is too broad, it means UE-B can do whatever it wants, e.g., UE-B may totally skip Mode 2 sensing procedure, etc.  To be more accurate, we suggest the following red changes.  ==  Draft proposal 3-16:  For the case when it is not possible that the number of candidate single-slot resources after applying the received non-preferred resource set as per the existing agreement meets the requirement of X\*M\_total,  It is up to UE-B’s implementation ~~how to meet this requirement~~ whether or not to use the received non-preferred resource set |
| OPPO | yes | We are also fine with “UE-B does not use the received non-preferred resource sets in its resource selection” |
| Ericsson | No | The Tx UE can use its own resource set if there are no enough resources. |
| Spreadtrum | Yes |  |
| Vivo | No | Clarify which implementation is allowed, e.g., UE can give up the non-preferred resources, or selects part of the non-preferred resource, to meet the requirement.   * It is up to UE-B’s implementation to use none or part of the non-preferred resource(s) to meet the requirement of X\*M\_total, when applying all the non-preferred resource(s) cannot meet the requirement of X\*M\_total. |
| xiaomi | comment | We prefer to support that UE-B does not use the received non-preferred resource sets in its resource selection，but we can accept the FL’s proposal. |
| Panasonic | Yes |  |

Q4-18: Do you agree following draft conclusion for condition when Option B can be used for preferred resource set?

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| --- |
| **FL’s observation of 3rd email discussion (Condition when Option B can be used for preferred resource set)**   * Option 1: DCM, vivo, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Franhofer, Huawei, Intel, Samsung, Ericsson, Futurewei, (13) * Option 2: DCM, vivo, LGE, OPPO, NEC, xiaomi, Franhofer, Huawei, Apple, Futurewei, InterDigital, (11) * Option 3: vivo, OPPO, NEC, xiaomi, Franhofer, Huawei, Apple, Futurewei, Qualcomm, InterDigital, (10) * Option 4:   + UE-B has a capability of performing sensing/resource exclusion, but UE-B is (pre)-configured not to perform sensing/resource exclusion in SL DRX : InterDigital, (1) |

Draft proposal 3-17:

For Scheme 1, Option B can be used for preferred resource set when one of following condition is met:

* Option 1: UE-B does not have a capability of performing sensing/resource exclusion.
* Option 2: UE-B performs random resource selection.
* Option 3: UE-B has a capability of performing sensing/resource exclusion, but UE-B determines not to perform sensing/resource exclusion by its implementation.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes | All the 3 cases should be considered in the case where UE-B does not have its own sensing results. For Option 1 and 2, the UE should be capable of receiving the IUCs. |
| Intel | No | We support Option 1 only. Other options require more discussion and details if there is an intention to support it. |
| Apple | Yes |  |
| LGE | No | Currently, we support Option 1 and Option 2. When Rel-16 UE and Rel-17 UE coexist in the same resource pool, Option 3 will cause performance degradation on Rel-16 UEs. |
| Qualcomm | Comment | Option 3, in our view, is the most important use case for power saving.  As we understand the proposal, all three options will be supported in Rel-17. In which case, we support the proposal. |
| Samsung | Comment | Only Option 1 |
| NTT DOCOMO | No | Issue here is whether Option 3 (and/or Option 2) is allowed or not. Now this proposal means that Option 3 is allowed; we do not support this proposal. As commented, UE in Option 3 ignores its surrounding UEs. Collision will increase. |
| Futurewei | Yes | We support all three options. |
| CATT, GOHIGH | Yes with comments | From our understanding, the three options are all possible if UE-B is capable of NR-SL reception. If this is the situation, it would be better to add a note.  Note: the pre-requisite of UE-B is capable of NR-SL reception. |
| Huawei, HiSilicon | Yes with comments | We support all three options.  Option 3 has the benefit of UE-B power saving, and also has the benefits of reduced interference when one UE-A can help multiple UE-Bs (e.g., RSU scenario).  We suggest to add “at least” as below, because some Options might be satisfied simultaneously, e.g., Option 1 and 2, etc.  ==  Draft proposal 3-17:  For Scheme 1, Option B can be used for preferred resource set when at least one of following condition is met:   * Option 1: UE-B does not have a capability of performing sensing/resource exclusion. * Option 2: UE-B performs random resource selection. * Option 3: UE-B has a capability of performing sensing/resource exclusion, but UE-B determines not to perform sensing/resource exclusion by its implementation. |
| OPPO | yes |  |
| Ericsson | No | Only Option 1. |
| Spreadtrum | Yes | At least Option 1 should be supported. We are fine will Option 2 and Option 3. |
| vivo | Comment | All the options are feasible. |
| Sharp |  | Only Option 1 |
| Panasonic | Yes |  |

Q4-19: Do you agree following draft conclusion for latency bound of inter-UE coordination information?

|  |
| --- |
| **FL’s observation of 3rd email discussion (Latency bound of inter-UE coordination information)**   * Support: DCM, LGE, OPPO, Huawei, Samsung, Ericsson, Nokia, Qualcomm, InterDigital, (9) * Not support: xiaomi, Intel, Futurewei, (3) |

Draft conclusion 3-9:

* For latency bound of inter-UE coordination information transmission, RAN1 relies on RAN2’s decision as per LS R1-2200880 from RAN2

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| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel |  | No need for conclusion.  RAN2 was not responsible for design of IUC and resource allocation. Offloading discussion to RAN2 may delay progress as there are many details |
| LGE | Yes | It would be helpful to clarify RAN1’s plan or remaining issues. |
| Qualcomm | Yes |  |
| Samsung | Yes |  |
| NTT DOCOMO | Yes |  |
| Futurewei | No | We do not think it is appropriate for RAN2 to define the bound as a lot of parameters are PHY parameters, e.g., n+T1, n+T2 signalled in PHY and most timing requirements are specified in RAN1, e.g., Tproc,0, Tproc,1 etc. We prefer RAN1 to discuss the latency bound as RAN1. |
| CATT, GOHIGH |  | No need for conclusion.  From our understanding, we think the impacts on resource allocation due to latency bound of inter-UE coordination should be discussed in RAN1. |
| Huawei, HiSilicon | Yes | As shown in RAN2’s summary R2-2203159 (see “Issue 4. Timer to handle latency bound for inter-UE coordination”), RAN2 already had quite in-depth discussions on the latency bound issue and will continue discussing it. For example, as shown in R2-2203159, RAN2 raised 8 questions and come up with 15 proposals (see Proposal 4-x in R2-2203159)!  RAN1 should avoid such duplicated discussions to save time. |
| OPPO | yes |  |
| Ericsson | Yes |  |
| Fujitsu | Yes |  |
| Vivo | No | Even when RAN2 does not support, RAN1 can further discuss to address RAN1 issues |
| xiaomi | no | From our understanding, RAN2 would only define the timer for the delay bound. Issues on how the bound would have impact on resource (re)selection and how the bound is determined can only be discussed in RAN1. Meanwhile, the RAN2 only discuss the timer for request-based inter-UE coordination, but the timer for condition-based inter-UE coordination also need be discussed, so the latency bound need be discussed in RAN 1. |
| Panasonic | Yes |  |

Q4-20: Do you agree following draft conclusion on 2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C?

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| --- |
| **FL’s observation of 3rd email discussion (2nd SCI format(s) than can be used to schedule retransmission of a TB containing inter-UE coordination information initially scheduled by a SCI format 2-C)**   * Support: DCM, vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Nokia, (10) * Not support: Huawei, Intel, Apple, Samsung, Ericsson, Futurewei, Qualcomm, Sharp, (8)   + Use only SCI format 2-C for the retransmission: Huawei, Intel, Apple, Ericsson, Qualcomm, Sharp, (6)   + Not use a SCI format 2-C for the retransmission: Samsung, (1)   + Not support retransmission of inter-UE coordination information: Futurewei, (1) |

Draft conclusion 3-20:

* No consensus on any restriction on a 2nd SCI format that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C.

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| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Comment | While we are fine with using any 2nd SCI format for retransmissions, we are open to using only SCI format 2-C. If the group cannot converge, we can accept the proposal as a compromise. |
| Intel |  | Prefer to understand what it means / Feature is supported? |
| Nokia, NSB | Yes |  |
| Apple | Yes | We can accept the proposal as a compromise. |
| LGE | Yes |  |
| Qualcomm | No | While the current status is that there’s no consensus, the issue of maintaining the same TB sizes if different SCI-2 formats are used for retransmission remains. At the very least, the following additional restriction is needed:  The calculated TB size cannot be changed between retransmissions. |
| Samsung | Comment | While it is true that there is currently no consensus, we would like to point out that re-transmission of SCI Format 2-C with the same information is redundant and degrades air interface capacity when the UE-A receives a NACK. A NACK reception is an indication that pervious SCI Format 2-C has been successfully received. |
| NTT DOCOMO | Yes |  |
| Futurewei | No | We are not clear on the meaning or outcome of the conclusion, whether any 2nd SCI format is allowed or it is restricted to be SCI 2-C. We prefer the same SCI 2-C is used for retransmission. |
| CATT, GOHIGH | No | We are not fully understanding this proposal.  Since when 2nd SCI format 2C is used, it is only for unicast. But SCI format 2B is only used for groupcast. We think it is not aligned between the cast type. |
| Huawei, HiSilicon | See comment | We assume it is common understanding that at least SCI 2-C can be used for re-retransmission if initially scheduled by a SCI format 2-C.   * If companies have different view on this aspect (i.e., SCI 2C cannot be used in this case), we would be surprised and would like to know why.   So the issue here is if 2nd SCI formats other than SCI 2C can be used for re-transmission in this case.  To our understanding, only SCI 2C can be used in this case.  Because as we pointed out previously, different 2nd SCI format have different size, thus occupy different number of REs. As per current spec, this will further impact TBS determination, resulting in different TBS for initial and retransmission(s) of the same TB and causing HARQ combining infeasible. This technical comment still stands since we do not see any different understandings here.  So we suggest the following red changes.  ==  Draft conclusion 3-20:   * No consensus on ~~any restriction on a~~ 2nd SCI format other than SCI format 2-C that can be used for retransmission of inter-UE coordination information MAC CE initially scheduled by a SCI format 2-C. |
| OPPO | yes |  |
| Ericsson | No | We think that only SCI format 2-C can be used to re-transmit the inter-UE coordination information. |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | Yes |  |
| Sharp | No | Same view as QC. |
| xiaomi | Yes |  |
| Panasonic | Yes |  |

Q4-21: Do you agree following draft conclusion for restriction(s) to the inter-UE coordination mechanism to address the power saving operation?

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| --- |
| **FL’s observation of 3rd email discussion (Restrictions to the IUC mechanism to address the power saving operation)**   * Support: Intel, Ericsson, (2) * Not support: vivo, LGE, OPPO, Fujitsu, Spreadtrum, NEC, xiaomi, Fraunhofer, Huawei, Samsung, Qualcomm, Sharp, InterDigital, (13) * Comments:   + Consider RAN2 impact: Apple, Futurewei, (2) |

Draft conclusion 3-19:

RAN1 does not pursue specific enhancement on UE-A’s behavior canceling inter-UE coordination information transmission when the amount of sensing performed by UE-A is below a certain threshold

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| --- | --- | --- |
| Company | Yes or no | Comments |
| Fraunhofer | Yes | Our understanding is that UE-A is a full sensing UE, not sure how this scenario would present itself. Hence we are fine with the proposal. |
| Intel | No | Our understanding the intention is not to cancel but rather not to trigger generation.  For sidelink transmission, sensing was introduced in R16. In R17, IUC is defined to improve sensing. If feedback is not based on sufficient sensing information it may degrade R16. |
| Apple |  | We are fine with the direction of pursuing specific enhancement, if the threshold has no RRC impact. Otherwise, we can live with the proposed conclusion. |
| LGE | Yes | As per agreement, there are possibilities that UE-A does not trigger inter-UE coordination information generation. |
| Qualcomm | Yes |  |
| Samsung |  | We think that we do not need to spend time for this conclusion. |
| NTT DOCOMO |  | Same view with Apple. |
| Futurewei | Yes with comments | We are ok with the conclusion. But we feel it is ok to have an agreement that IUC is only transmitted when the UE performs full sensing. |
| CATT, GOHIGH |  | We share similar views as Intel, if UE-A doesn’t have sufficient sensing results, it can not be triggered to transmit IUC information in scheme 1. |
| Huawei, HiSilicon | Yes | There is no time for RAN1 to discuss additional optimization issues. |
| OPPO | yes | Agree with Fraunhofer’s understanding. |
| Ericsson | No | We have a similar view as Intel. If the UE does not perform enough sensing the resources sent are likely not reliable or not useful for the receiving UE. |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | YES |  |
| Xiaomi | Yes | Further enhancement is not necessary at this stage. |
| Panasonic | Yes |  |

Q4-22: Do you agree following draft conclusion for UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection?

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| --- |
| **FL’s observation of 3rd email discussion (UE-B’s behavior to consider “the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI” as non-preferred resource(s) in its resource selection)**   * Support: vivo, OPPO, Spreadtrum, xiaomi, Intel, Nokia, Qualcomm, Sharp , InterDigital, (9) * Not support: DCM, Fujitsu, NEC, Huawei, Samsung, Ericsson, LGE, (7) * Comments:   + Not support the case when a SCI format 1-A is transmitted without PSSCH: LGE, (1)   + Define similar behavior for unicast and groupcast to target RX UE: Intel, (1)   + UE-A is the destination UE of the TB to be transmitted by UE-B: Apple, Futurewei, (2) |

Draft conclusion 3-18:

No consensus on UE-B’s behavior using the slot(s) overlapped with UE-A’s reserved resource(s) by 1st stage SCI as non-preferred resource(s) in its resource selection for unicast/groupcast transmission

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| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Comment | We can accept it if the similar behavior is defined for unicast and groupcast transmissions to target RX |
| Nokia, NSB | Yes |  |
| Apple | Yes |  |
| LGE | Yes |  |
| Qualcomm | No | We agree that this issue exists in Rel. 16 and that is the reason why we have this work item in Rel. 17 with the objective to handle the half-duplex issue. RAN 1 has agree that this objective should be fulfilled by the following working assumption:   * *For Scheme 1 with non-preferred resource set, support following condition:*   + *Condition 1-B-2:*     - *Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation.*   As there is no differentiation between 1-B-1 and 1-B-2 in the set of non-preferred resource indicated in SCI-2 or MAC-CE. We have not had any discussion so far on this as this, supporting this behavior is the only way to implement condition 1-B-2 in a meaningful way.  In this proposal, SCI-1 is always transmitted with the corresponding data or MAC-CE carrying inter-UE coordination information from UE-A. UE-A is the intended receiver of UE-B. So, UE-B should avoid the slot containing the resource reserved for transmission by UE-A as indicated in SCI-1 to fulfill condition 1-B-2. |
| Samsung |  | We think that we do not need to spend time for this conclusion. |
| NTT DOCOMO | Yes |  |
| Futurewei | Yes with comment | We are ok with the conclusion, but we are open to discuss FL proposal in previous round. |
| CATT, GOHIGH | Yes |  |
| Huawei, HiSilicon | Yes | There is no time for RAN1 to discuss additional optimization issues. |
| OPPO | yes | For progress we can accept the conclusion. |
| Ericsson | Yes | No need to discuss it further |
| Spreadtrum | Yes |  |
| Fujitsu | Yes |  |
| Vivo | No | We have not received any technical reason, why not support it. Prefer to continue discussion in GTW.  [vivo2]  1.To companies who have concern on the signaling.  Regarding whether reservation signaling can be regarded as IUC, this is FFS in previous meeting, we think it can be without additional modification on signaling design. The slots overlapped with reserved resource is non-preferred resource  2.To Huawei’s comment as following, we think UE-B can selects either Rel-16 or Rel-17 resource exclusion behaviour only scheme 1 non-preferred resource is allowed in the pool.  “For R16 sensing procedures, reserved resources by 1st SCI will be excluded using RSRP (i.e., in step 6 of TS 38.214 clause 8.1.4).  However, if this proposal is agreed, reserved resources by 1st SCI will be excluded after step 6) directly, i.e., regardless of their RSRP. This is very different from legacy sensing procedures.” |
| Sharp | Yes |  |
| Xiaomi | Yes | We are fine with the FL’s proposal. |
| Panasonic | Yes |  |
|  |  |  |

* 1. **Others**

Q4-23: Do you agree following draft conclusion for the reply LS to RAN2?

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| **FL’s observation of 3rd email discussion (conclusion for the reply LS to RAN2)**   * Support: DCM, LGE, OPPO, Fujitsu, xiaomi, Huawei, Ericsson, Futurewei, Qualcomm, Sharp, InterDigital, (11) * Not support: NEC, Intel, (2) |

Draft conclusion 3-21:

* No consensus for RAN1 to send a reply LS of R1-2200880 to RAN2.

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| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | OK |  |
| Apple | No | If the MAC CE field or field size is up to RAN2, we need to notify RAN2 about this conclusion. Otherwise, RAN2 is still relying on RAN1 on the design. |
| LGE | Yes |  |
| Samsung | Comment | We can send list of agreements that impact RAN2 especially the MAC CE contents. |
| NTT DOCOMO | OK |  |
| Futurewei | Yes | We are ok with the conclusion. |
| Huawei, HiSilicon | Yes |  |
| OPPO | yes |  |
| Ericsson | Ok |  |
| Fujitsu | Yes |  |
| xiaomi | Yes |  |

1. **Summary of contributions**
   1. **Scheme 1**

* Finalization of contents and containers of UE-A’s inter-UE coordination information and UE-B’s explicit request, including determination of destination UE(s) for UE-A’s inter-UE coordination information and UE-B’s explicit request
  + Remaining details on determining preferred resource set
    - If inter-UE coordination information is triggered by a condition rather than request reception
      * Setting of resource selection window
        + T\_1 and T\_2 are (pre)configured and slot n is a slot when UE-A start to process the sensing and resource selection [Futurewei,3] (1)
        + T\_2-T\_1 is (pre)configured [Intel,14] (1)
      * Minimum number of candidate single-slot resources for feedback [Intel,14] (1)
      * No further change is supported [OPPO,6] [CMCC,17] [ZTE,29] (3)
    - Further consideration on modification of T\_scal [Sharp,23] (1)
  + Remaining details on bit field size of contents of inter-UE coordination information
    - Reference slot indication
      * 10+ ceil( log2(10\*2^u)) where u is 0, 1, 2, 3 for SCS of 15, 30, 60, 120, respectively
        + Supported by [Huawei,1] [CATT,7] [Apple,15] [Samsung,20] [LGE,26] [ZTE,29] (6)
    - Slot offset for first resource location
      * Ceil(log2(N\_slot\_offset)) where N\_slot\_offset is the number of entries in the (pre)configured values set from [0, 255]
        + Supported by [Huawei,1] (1)
      * Ceil(log2(maximum value of slot offset))
        + Supported by [DCM,9] [Apple,15] (2)
      * 8 bits
        + Supported by [Samsung,20](for TRIV other than first TRIV) [ZTE,29](for TRIV other than first TRIV in a SCI format 2-C) (2)
      * 0 bit
        + Supported by [Samsung,20](for first TRIV) [ZTE,29](for first TRIV) (2)
      * Ceil(log2(maximum value of slot offset/31))
        + Supported by [LGE,26] (1)
    - Resource set indication for each combination
      * Up to 26 bits [Huawei,1] [Panasonic,5] [CATT,7] [DCM,9] [Apple,15] [Samsung,20](for non-preferred resource set) [LGE,26] (7)
      * Up to 22 bits [Samsung,20](for preferred resource set) [ZTE,29] (2)
    - Resource set type
      * Always 1 bit
        + Supported by [Huawei,1] [CATT,7] [LGE,26] (3)
      * 0 bit if request contains “resource set type indication” and if condition-based IUC is disabled. Otherwise, 1 bit.
        + Supported by [Apple,15] (1)
  + Remaining details on first resource location indication of each TRIV
    - Maximum value of slot offset for the first resource location indication
      * 16
        + Supported by [Apple,15](for SCI format 2-A as a baseline) (1)
      * 32
        + Supported by [Qualcomm,22](when SCI format 2-C is used) (1)
      * 256
        + Supported by [Huawei,1] [CATT,7](for 2nd SCI) [DCM,9] [Apple,15](for SCI format 2-A as a baseline) (4)
      * 1023
        + Supported by [ZTE,29] (1)
      * 4092
        + Supported by [OPPO,6] (1)
      * 8000
        + Supported by [CATT,7](for MAC CE) [LGE,26] (2)
      * 8192
        + Supported by [Futurewei,3] [Samsung,20] (2)

Possible values of (pre)configured maximum value is form of 2^k -1 [Futurewei,3] [Samsung,20]

* + - * Maximum reservation periodicity configured in the pool \* 2^u
        + Supported by [Qualcomm,22](when MAC CE only is used) (1)
    - Granularity of slot offset
      * 1
        + Supported by [CATT,7] [DCM,9] [Apple,15] [Qualcomm,22] (4)
      * 31
        + Supported by [LGE,26] (1)
      * Candidates themselves are (pre)configured
        + Supported by [Huawei,1] (1)
      * Determined by the bit field size for indicating slot offset and SCS (e.g., 1, 2, 4, 8, 16, 32)
        + Supported by [Samsung,20] (1)
    - Whether or not UE-A provide preferred or non-preferred resources for each first resource location
      * Supported with additional indicating the lowest subchannel index of each first resource
        + [OPPO,6] [ETRI,13] [Apple,15] (3)
      * Supported with additional indicating the lowest subchannel index of first resource of a first combination
        + Supported by [Intel,14] (1)
      * Not support
        + [Huawei,1] (1)
    - Further consideration on modifying the definition of reference slot [ETRI,13] [Intel,14] (2)
  + Remaining details on bit field size of contents of an explicit request
    - Starting and ending time locations of a resource selection window
      * 2\*{10+ ceil( log2(10\*2^u))} where u is 0, 1, 2, 3 for SCS of 15, 30, 60, 120, respectively
        + Supported by [Huawei,1] [CATT,7] (2)
    - Resource set type
      * 0 or 1 bit as per (pre)configuration
        + Supported by [Apple,15] (1)
  + Details on a SCI format 2-C
    - SCI fields design
      * SCI fields for a SCI format 2-A
        + Supported by [Huawei,1] [DCM,9] [Apple,15] [Xiaomi,19] [ITL,25] [LGE,26] [Ericsson,27] [ZTE,29] (8)

[vivo,4] [Panasonic,5]: Cast type is not included for an explicit request

* + - * SCI fields for both a SCI format 2-A and 2-B
        + Supported by [Panasonic,5] [CATT,7] [Intel,14] [Samsung,20] (4)
    - Condition of that a SCI format 2-C can be used as container of inter-UE coordination information
      * Keep N<=3 (i.e., remove square brackets)
        + Supported by [LGE,26] [Ericsson,27] (2)

[LGE,26]: Add “UE does not expect that the total payload size of a SCI format 2-C with N=3 exceeds 140 bits” as a note

* + - * N<=2
        + Supported by [CATT,7] [DCM,9] [Apple,15] (3)
      * Remove N parts
        + Supported by [Intel,14] (1)
      * Both N<=3 and N<=2
        + Supported by [Samsung,20] (1)
      * Further consideration on additional condition of that a SCI format 2-C can be used [Intle,14] [Qualcomm,22]
        + [Intel,14]: a SCI format 2-C can be used for preferred resource set
        + [Qualcomm,22]: a SCI format 2-C can be used for the case when other data is not multiplexed with inter-UE coordination information
  + Cast type(s) of inter-UE coordination information transmission with preferred resource set triggered by a condition other than explicit request reception on top of unicast
    - Neither groupcast nor broadcast
      * Supported by [vivo,4] [Panasonic,5] [OPPO,6] [DCM,9] [Spreadtrum,11] [CMCC,17] [Samsung,20] [LGE,26] [Ericsson,27] [Mitsubishi,28] [ZTE,29] (11)
    - Groupcast
      * Supported by [Futurewei,3] [Fraunhofer,30] (2)
    - Groupcast and broadcast
      * Supported by [Intel,14] (1)
    - Up to RAN2/SA2 decision
      * Supported by [Huawei,1] (1)
  + Latency bound of inter-UE coordination information transmission triggered by UE-B’s explicit request
    - Supported by [vivo,4] [CATT,7] [Intel,14] [Apple,15] [Xiaomi,19] [Qualcomm,22] [Sharp,23] [ITL,25] [Fraunhofer,30] (9)
      * PC5-RRC configured
        + Supported by [vivo,4] (1)
      * (pre)configured
        + Supported by [CATT,7] [Intel,14] [Xiaomi,19] (3)
      * Indicated by UE-B’s request
        + Supported by [CATT,7] [Apple,15] [Sharp,23] [ITL,25] [Fraunhofer,30] (5)
      * 8 slots
        + Supported by [Qualcomm,22](for standalone inter-UE coordination information) (1)
      * Derived based on the starting time of resource selection window provided by UE-B’s request
        + Supported by [Sharp,23] (1)
  + Further consideration on modifying UE-A’s procedure for determining a set of resources [Nokia,2] [vivo,4] [CATT,7] [Intel,14] [ASUSTeK,16] [Fraunhofer,30] (6)
  + Further consideration on additional contents of the inter-UE coordination information in Scheme 1 [InterDigital,10] [Intel,14] [ASUSTeK,16] (3)
  + Further consideration on differentiating supported cast type for each condition of non-preferred resource set [OPPO,6] [CMCC,17] [Mitsubishi,28] (3)
    - Up to UE-A’s implementation [DCM,9] (1)
  + Further consideration on additional contents of the request for the inter-UE coordination information in Scheme 1 [Nokia,2] [Fujitsu,8] (2)
  + Further consideration on specifying additional details on Condition 1-A-2/1-B-2/2-A-2 [vivo,4] [Intel,14] (2)
  + Further consideration on additional condition for determining a set of resources [Nokia,2]
  + Further consideration on parameter setting for determining the non-preferred resource set [Futurewei,3]
  + Further consideration on modifying re-evaluation/pre-emption operation considering the received non-preferred resource set [vivo,4]
  + Further consideration on using UE-A’s resource reservation period as coordination information [vivo,4]
  + Further consideration on modifying the cast type of request signaling [Intel,14]
  + Further consideration on modifying the cast type of inter-UE coordination information transmission triggered by an explicit request [Intel,14]
  + Further consideration on modifying the cast type of inter-UE coordination information transmission triggered by a condition other than explicit request reception [Xiaomi,19]
  + Further consideration on the case when only a SCI format 2-C is used as a container of inter-UE coordination information and/or its request [Samsung,20]
  + Further consideration on the possibility of that different parameters of the request are transmitted by a SCI format 2-C and MAC CE [Intel,14]
  + Further consideration on modifying interpretation rule for TRIV [ASUSTeK,16]
* Finalization of behavior of UE-B receiving resource set(s) from UE-A(s)
  + UE-B’s behavior when UE-B receives multiple inter-UE coordination information from the same UE-A
    - UE-B uses the latest inter-UE coordination information in its resource selection
      * Supported by [Panasonic,5] [LGE,26](for preferred resource set) (2)
    - UE-B determines one of them by implementation to use in its resource selection
      * Supported by [LGE,26] (1)
  + UE-B’s behavior when UE-B receives multiple inter-UE coordination information from the different UE-As
    - For preferred resource set,
      * UE-B uses one inter-UE coordination information for each UE-A
        + Supported by [Panasonic,5] [DCM,9] (2)
      * UE-B uses multiple inter-UE coordination information in its resource selection
        + Supported by [Apple,15] [Samsung,20] (2)
      * UE-B determines one of them by implementation to use in its resource selection
        + Supported by [LGE,26] (1)
    - For non-preferred resource set,
      * UE-B uses multiple inter-UE coordination information in its resource selection
        + Supported by [Panasonic,5] [DCM,9] [Apple,15] [Samsung,20] [Qualcomm,22] (5)
      * UE-B determines one of them by implementation to use in its resource selection
        + Supported by [LGE,26] (1)
    - For preferred resource set and non-preferred resource set,
      * UE-B uses preferred resource later
        + Supported by [DCM,9] (1)
      * UE-B determines one of them by implementation to use in its resource selection
        + Supported by [LGE,26] (1)
      * Not supported by [Samsung,20] (1)
  + Further consideration on modifying UE-B’s resource selection procedure based on the received set of resources [Nokia,2] [vivo,4] [CATT,7] [Fujitsu,8] [ITL,25] (5)
    - [Nokia,2]: Overlapping portion dependent resource exclusion
    - [vivo,4]: Restrict maximum number of resource exclusion, change the definition of M\_total
    - [CATT,7]: Additional candidate single-slot resource ratio
    - [Fujitsu,8] [ITL,25]: Canceling a subset of resource exclusion
  + Further clarification on the condition for using Option B [DCM,9] [Qualcomm,22] [Ericsson,27] (3)
    - [DCM,9]: UE that does not support sensing/resource exclusion, UE that supports sensing/resource exclusion but performs random selection for the corresponding transmission
    - [Qualcomm,22]: UE that supports sensing/resource exclusion but does not perform sensing/resource exclusion
    - [Ericsson,27]: UE that does not support sensing
  + Further consideration on specifying cast type(s) of UE-B’s transmission that can use inter-UE coordination information [CATT,7] [Qualcomm,22] [Mitsubishi,28] (3)
  + Further considering on specifying a condition of skipping the received inter-UE coordination information [Intel,14] [Sharp,23]
  + Further consideration on specifying format translation from the received set of resources to candidate single-slot resources [Intel,14]
* Finalization of when and with which information UE-A generates and/or transmits an inter-UE coordination information, including triggering based on condition(s) other than an explicit request
  + Sensing window for determining the set of resources
    - Sensing window prior to the transmission time (slot n) of UE-A’s inter-UE coordination information
      * Supported by [Huawei,1] [OPPO,6] [CATT,7] [Xiaomi,19] (4)
        + [n-T\_0-T\_proc,1, n-T\_proc,0-T\_proc,1]: [Huawei,1] [CATT,7] [Xiaomi,19] (3)
        + [n-T\_0-T\_ 3, n-T\_proc,0-T\_ 3]: [OPPO,6] (1)
    - Sensing window prior to the resource selection window for transmitting UE-A’s inter-UE coordination information
      * Supported by [Intel,14]
        + [?, n-T\_proc,0-T\_proc1] where n is the beginning of the resource selection window: [Intel,14]
    - No additional spec change is needed for sensing window for determining the set of resources
      * Supported by [LGE,26]
  + Further consideration on additional condition triggering inter-UE coordination information [Nokia,2] [Intle,14] [Samsung,20] [Ericsson,27] [Fraunhofer,30] (5)
* Finalization of when UE-B generates and/or transmits an explicit request
  + Further consideration on additional condition triggering an explicit request for inter-UE coordination information [vivo,4] [Intel,14] [NEC,18] [Ericsson,27] (4)
* Finalization of resource selection and/or multiplexing with sidelink transmissions for UE-A’s inter-UE coordination information and UE-B’s explicit request
  + Further consideration on additional restriction on inter-UE coordination information transmission [Intel,14] [Qualcomm,22] [Lenovo,24] [Ericsson,27] (4)
    - [Intel,14]: Resource selection window for inter-UE coordination information transmission is inside of a resource selection window for determining the set of resources
    - [Qualcomm,22] [Ericsson,27]: For inter-UE coordination information transmission without multiplexing with other data, retransmission is not supported
    - [Qualcomm,22]: For inter-UE coordination information transmission without multiplexing with other data, the number of subchanel is 1 and a remaining PDB is 8 slots
    - [Lenovo,24]: The ending time of a resource selection window for inter-UE coordination information transmission is not after the starting time of a resource selection window for determining the set of resources
  + Further consideration on multiplexing inter-UE coordination information, an explicit request, and data in a PSSCH [Intel,14]
  + Further consideration on updating UE-A’s resource (re)selection procedure for its transmission based on UE-A’s inter-UE coordination information [ASUSTeK,16]
  + Further consideration on dedicated resources for inter-UE coordination information transmission [ITL,25]
* Finalization of prioritization of inter-UE coordination information and explicit request
  + Further consideration on default priority value for inter-UE coordination information triggered by a condition rather than request reception [Huawei,1] [Futurewei,3] [DCM,9] [Intel,14] [CMCC,17] (5)
    - Up to UE-A’s implementation [Huawei,1] [Futurewei,3] [CMCC,17](for preferred resource set) (3)
    - Up to UE-A’s implementation with (pre)configured lower limit of priority value [Panasonic,5] (1)
    - Fixed to 8 [DCM,9] (1)
    - Same as priority value of indicated by other UE’s SCI [CMCC,17](for non-preferred resource set) (1)
    - Not supported by [OPPO,6] (1)
  1. **Scheme 2**
* Finalization of determination of PSFCH resource/index for conflict indication
  + Frequency and code domain resources derived by
    - m\_CS
      * 0
        + Supported by [Futurewei,3] [OPPO,6] [DCM,9] [Intel,14] [Samsung,20] [Qualcomm,22] [LGE,26] [Ericsson,27] [ZTE,29] (9)

[Intel,14]: it up to UE implementations whether/how to set the reservation period in the re-selected resource

[Qualcomm,22]: UE A sends PSFCH conflict indicator to UE B if a resource conflict is detected in the next SPS period

* + - * Based on target TB (0 for current TB, 6 for next TB(s))
        + Supported by [Huawei,1] [Nokia,2] [CATT,7] [InterDigital,10] [Spreadtrum,11] [Apple,15] (6)
    - m\_0 determination based on PSFCH resource index
      * In the same way as specified in TS 38.213 Section 16.3
        + Supported by [Huawei,1] [Panasonic,5](when different PRB is used) [CATT,7] [DCM,9] [Spreadtrum,11] [Intel,14] [Apple,15] [Samsung,20](when the different PRB is used) [Qualcomm,22] [LGE,26] [Ericsson,27] [ZTE,29] (12)
      * A value of m\_0 is (pre)configured
        + Supported by [Panasonic,5](when the same PRB is used) (1)
      * Circular offset is additionally applied to values of m\_0 as specified in TS38.213 Section 16.3
        + Supported by [Samsung,20](when the same PRB is used) (1)
    - Case when the same PRB is used for both SL HARQ-ACK feedback and a resource conflict indication
      * Supported by [Futurewei,3] [Samsung,20] (2)
      * UE does not expect it [Huawei,1] [CATT,7] [Qualcomm,22] [ZTE,29] (4)
* Finalization of behavior of UE-B receiving a conflict indication from UE-A
  + Further consideration on UE-B’s behavior for handling a resource conflict in periodic reserved resources [Huawei,1] [Nokia,2] [CATT,7] [InterDigital,10] [Spreadtrum,11] [Apple,15] (6)
    - Not supported by [Futurewei,3] [OPPO,6] [DCM,9] [Intel,14] [Samsung,20] [LGE,26] [Ericsson,27] (7)
  + Further consideration on skipping the received resource conflict indication [Nokia,2] [OPPO,6] [Fujitsu,8] [Ericsson,27] (4)
  + Further consideration on specifying conditions to skip a transmission of a resource conflict indication [Nokia,2] [Fujitsu,8] [Intel,14] (3)
  + Further clarification on the next reserved resources subject to processing time budget [DCM,9] (1)
* Finalization of prioritization of conflict indication
  + Further consideration on modifying executing order of prioritization of PSFCH for a resource conflict [ETRI,13] [Apple,15] [Xiaomi,19] (3)
    - [ETRI,13] [Xiaomi,19]: PSFCH TX/TX or TX/RX prioritization is performed first
    - [Apple,15]: prioritization between PSFCH TX or RX and other channel(s) is performed first
  + Further consideration on modifying prioritization rule for PSFCH TX of SL HARQ-ACK feedback and a resource conflict indication [ETRI,13] (1)
  + Further consideration on the issue due to imbalanced prioritization between PSFCH TX and RX for a resource conflict indication [Apple,15] (1)
* Finalization of how to determine UE-B among UEs scheduling conflicting TBs, including whether/how to handle, or differently handle, the case when at least one of UEs scheduling conflicting TBs doesn’t support Scheme 2
  + Based on a second UE flag (i.e., whether UE scheduling a conflict TB can be UE-B or not) indicated by UE-B’s SCI format 1-A: [Huawei,1] [Futurewei,3] [Panasonic,5] [OPPO,6] [CATT,7] [DCM,9] [InterDigital,10] [Apple,15] [Sharp,23] [LGE,26] (10)
    - UE pairing for selecting UE-B considers only UEs transmitting SCI format 1-A with Second UE flag of 1
      * Supported by [Huawei,1] [Panasonic,5] [OPPO,6] [CATT,7] [DCM,9] [LGE,26] (6)
    - Drop PSFCH TX when the selected UE-B does not support Scheme 2 after applying the existing WA for selecting UE-B
      * Supported by [Nokia,2] [Sharp,23] [Ericsson,27] (3)
    - At least one of UEs scheduling conflicting TBs does not support scheme 2, all other UEs transmitting SCI format 1-A with a second flag of 1 are UE-Bs
      * Supported by [Futurewei,3] [Apple,15] (2)
  + Based on whether PSFCH occasion(s) for resource conflict indication is passed or not: [Huawei,1] [OPPO,6] [Fujitsu,7] [LGE,26] (4)
    - UE pairing for selecting UE-B considers only UEs whose PSFCH occasions for a resource conflict indication are not yet passed
      * Supported by [Huawei,1] [OPPO,6] [Fujitsu,7] [LGE,26] (4)
  + Based on priority value of UE-B’s transmission [InterDigital,10] (1)
  + Further consideration on specifying cast type of UE-B’s transmission that can receive a resource conflict indication [Futurewei,3] [CATT,7] [Fujitsu,8] (3)
  + Further consideration on tie-breaking for the case when conflicting TBs have the same priority [Futurewei,3] [Fujitsu,8] (2)
    - Up to UE implementation [Intel,14]
* Others
  + Further restrict or expand on the condition to be UE-A and/or UE-B [Nokia,2] [vivo,4] [Intel,14] [Ericsson,27] [Mitsubishi,28] (5)
  + Further consideration on modifying condition for determining a resource conflict [Nokia,2] [Fujitsu,8] [Intel,14] [Lenovo,24] (4)
  + Further consideration on ID sharing mechanism between UE-A and UE-B [Nokia,2]
  + Further consideration on modifying signaling granularity of enabling/disabling/controlling inter-UE coordination scheme [vivo,4]
  + Further consideration on specifying executing order for the case when multiple UE-B’s reserved resources are collided [vivo,4]
  + Further consideration on ensuring the time difference between successive UE-B’s reserved resources fulfil the processing time budget [CATT,7]
  + Further clarification on UE-A’s behavior when the case when one of SCI(s) scheduling the same reserved resources does not fulfill the processing time budget [Fujitsu,8]
  + Further consideration on modifying re-evaluation/pre-emption procedure without using inter-UE coordination information [Intel,14]
  + Further consideration on modifying UE-B’s resource (re)selection procedure based on a SCI format 1-A [Qualcomm,22]
  + Further consideration on inter-UE coordination with mode 1 operation [Lenovo,24]
  + Further consideration on power-saving UE with inter-UE coordination information [Ericsson,27]

1. **Reference**
2. R1-2200964 Inter-UE coordination in sidelink resource allocation Huawei, HiSilicon
3. R1-2200981 Inter-UE coordination for Mode 2 enhancements Nokia, Nokia Shanghai Bell
4. R1-2200983 Discussion on techniques for inter-UE coordination FUTUREWEI
5. R1-2201112 Remaining issues on mode-2 enhancements vivo
6. R1-2201182 Inter-UE coordination for Mode 2 enhancements Panasonic Corporation
7. R1-2201255 Inter-UE coordination in mode 2 of NR sidelink OPPO
8. R1-2201336 Remaining issues on Inter-UE coordination for Mode 2 enhancements CATT, GOHIGH
9. R1-2201438 Discussion on inter-UE coordination for Mode 2 enhancements Fujitsu
10. R1-2201495 Remaining issues on sidelink resource allocation for reliability and latency NTT DOCOMO, INC.
11. R1-2201531 Discussions on remaining issues for Mode 2 inter-UE coordination InterDigital, Inc.
12. R1-2201558 Discussion on inter-UE coordination in sidelink resource allocation Spreadtrum Communications
13. R1-2201585 Discussion on inter-UE coordination for Mode 2 enhancements Sony
14. R1-2201617 Discussion on inter-UE coordination for Mode 2 enhancements ETRI
15. R1-2201716 Remaining opens of sidelink inter-UE coordination schemes Intel Corporation
16. R1-2201785 Remaining Issues of Inter-UE Coordination Apple
17. R1-2201820 Remaining issues on V2X mode 2 enhancements ASUSTeK
18. R1-2201874 Remaining issues on inter-UE coordination for mode 2 enhancement CMCC
19. R1-2201907 Discussion on mode 2 enhancements NEC
20. R1-2201920 Discussion on inter-UE coordination Xiaomi
21. R1-2202032 On Inter-UE Coordination for Mode2 Enhancements Samsung
22. R1-2202086 Discussion on Mode 2 enhancements MediaTek Inc.
23. R1-2202159 Reliability and Latency Enhancements for Mode 2 Qualcomm Incorporated
24. R1-2202202 Discussion on inter-UE coordination for mode 2 enhancements Sharp
25. R1-2202231 Inter-UE coordination for Mode 2 enhancements Lenovo, Motorola Mobility
26. R1-2202245 Inter-UE coordination for mode 2 enhancements ITL
27. R1-2202253 Discussion on inter-UE coordination for Mode 2 enhancements LG Electronics
28. R1-2202263 Details on mode 2 enhancements for inter-UE coordination Ericsson
29. R1-2202356 Inter-UE coordination for enhanced resource allocation Mitsubishi Electric RCE
30. R1-2202377 Remaining issues on the inter-UE coordination ZTE, Sanechips
31. R1-2202483 Inter-UE coordination for Mode 2 enhancements Fraunhofer HHI
32. **Appendix**
    1. **Conclusions made in RAN1#103-e meeting**

* ***Conclusion****:*
  + *The schemes of inter-UE coordination in Mode 2 are categorized as being based on the following types of “A set of resources” sent by UE-A to UE-B:*
    - *UE-A sends to UE-B the set of resources preferred for UE-B’s transmission*
      * + *e.g., based on its sensing result*
    - *UE-A sends to UE-B the set of resources not preferred for UE-B’s transmission*
      * + *e.g., based on its sensing result and/or expected/potential resource conflict*
    - *UE-A sends to UE-B the set of resource where the resource conflict is detected*
    - *FFS: details of resource conflict, e.g., including type of resource conflict*
    - *FFS: details of sensing operation at UE-A side*
    - *FFS: which type(s) of resource set information is(are) beneficial/feasible to which cast type(s)*
    - *Note: these different types may be used in combination with each other*
  + *From RAN1 perspective, further study on the feasibility/benefit of inter-UE coordination is required*
  + *Send an LS to RAN plenary*
    - *Final LS in R1-2009841*
* ***Conclusion****:*
  + *For the schemes of inter-UE coordination identified as feasible/beneficial, at least the following aspects are further discussed.*
    - *How/when UE-A determines the contents of ”A set of resources”, including consideration of UL scheduling*
    - *When UE-A sends ”A set of resources” to UE-B, including which UE(s) sends it*
    - *How UE-A and UE-B are determined*
    - *How UE-A sends ”A set of resources” to UE-B, including container used for carrying it, implicitly or explicitly or both*
    - *How/when/whether UE-B receives “A set of resources” and takes it into account in the resource selection for its own transmission*
    - *How/whether to define the relationship between support/signaling of inter-UE coordination and cast type*
  1. **Conclusions made in RAN1#104-e meeting**
* ***Conclusion****:*
  + *RAN1 concludes that the inter-UE coordination in Mode 2 is feasible, and is beneficial (e.g., reliability, etc.) compared to Rel-16 Mode 2 RA, and thus recommends specification of the feature.*
    - *The detailed observations can be found in the attachment of the LS*
* *Draft LS in R1-2102165, along with the attachment R1-2102166, is approved (with a typo fix)* 
  + *Final LS in R1-2102168*
  1. **Agreements made in RAN1#104bis-e meeting**
* *Agreement:*
  + *Support the following schemes of inter-UE coordination in Mode 2:*
    - *Inter-UE Coordination Scheme 1:* 
      * *The coordination information sent from UE-A to UE-B is the set of resources preferred and/or non-preferred for UE-B’s transmission*
        + *FFS details including a possibility of down-selection between the preferred resource set and the non-preferred resource set, whether or not to include any additional information other than indicating time/frequency of the resources within the set in the coordination information*
      * *FFS condition(s) in which Scheme 1 is used*
    - *Inter-UE Coordination Scheme 2:* 
      * *The coordination information sent from UE-A to UE-B is the presence of expected/potential and/or detected resource conflict on the resources indicated by UE-B’s SCI*
        + *FFS details including a possibility of down-selection between the expected/potential conflict and the detected resource conflict*
      * *FFS condition(s) in which Scheme 2 is used*
* *Agreement:*
  + *Study further to determine the conditions for UEs to be UE-A(s)/UE-B(s) for inter-UE coordination:*
    - *Details include applicable scenario(s)/inter-UE coordination scheme(s)*
    - *E.g., only UE(s) among the intended receiver(s) of UE-B can be a UE-A, any UE can be a UE-A, high-layer configured, etc.*
      * *Including the possibility of being subject to certain conditions and/or capability*
* *Agreement:*
  + *When UE-B receives the inter-UE coordination information from UE-A, consider at least one of the following options (with details FFS including possibly down-selecting/merging one or more of the options below, applicable scenario(s)/condition(s) for each option, UE behavior) for UE-B’s to take it into account in the resource (re)-selection for its own transmission*
    - *For scheme 1:*
      * *Option 1-1: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based on both UE-B’s sensing result (if available) and the received coordination information*
      * *Option 1-2: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based only on the received coordination information*
      * *Option 1-3: UE-B’s resource(s) to be re-selected based on the received coordination information*
      * *Option 1-4: UE-B’s resource(s) to be used for its transmission resource (re)-selection is based on the received coordination information*
    - *For scheme 2:*
      * *Option 2-1: UE-B can determine resource(s) to be re-selected based on the received coordination information*
      * *Option 2-2: UE-B can determine a necessity of retransmission based on the received coordination information*
  1. **Agreements made in RAN1#106-e meeting**
* *Agreement:*
  + *For scheme 1, the following inter-UE coordination information signalling from UE-A is supported. FFS details including condition(s)/scenario(s) under which each information is enabled to be sent by UE-A and used by UE-B.*
    - *Set of resources preferred for UE-B’s transmission*
    - *Set of resources non-preferred for UE-B’s transmission*
* *Agreement:*
  + *For scheme 2, the following inter-UE coordination information signalling from UE-A is supported. FFS details including condition(s)/scenario(s) under which each information is enabled to be sent by UE-A and used by UE-B*
    - *Presence of expected/potential resource conflict on the resources indicated by UE-B’s SCI*
      * *FFS: UE behaviour when the presence of expected/potential resource conflict is detected by the transmitter*
    - *FFS: Whether to additionally support the presence of detected resource conflict on the resources indicated by UE-B’s SCI*
* *Agreement:*
  + *In scheme 1, the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination information transmission triggered by an explicit request in Mode 2:*
    - *A UE that sends an explicit request for inter-UE coordination information can be UE-B*
    - *A UE that received an explicit request from UE-B and sends inter-UE coordination information to the UE-B can be UE-A*
    - *(Working assumption) At least a destination UE of a TB transmitted by UE-B can be UE A*
    - *The above feature can be enabled or disabled or controlled by (pre-)configuration*
      * *FFS: Details on how to support this, including (pre-)configuration signaling granularity*
    - *FFS: Additional details and conditions on UE-A and UE-B*
  + *(Working Assumption) In scheme 1, the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination information transmission triggered by a condition other than explicit request reception in Mode 2:*
    - *A UE that satisfies the condition mentioned in the main bullet and sends inter-UE coordination information is UE-A*
    - *A UE that received inter-UE coordination information from UE-A and uses it for resource (re-)selection is UE-B*
    - *The above feature can be enabled or disabled or controlled by (pre-)configuration*
      * *FFS: Details on how to support this, including (pre-)configuration signaling granularity*
    - *FFS: Additional details and conditions on UE-A and UE-B*
* *Agreement:*
  + *In scheme 2, at least the following is supported for UE(s) to be UE-A(s)/UE-B(s) in the inter-UE coordination transmission triggered by a detection of expected/potential resource conflict(s) in Mode 2:*
    - *A UE that transmitted PSCCH/PSSCH with SCI indicating reserved resource(s) to be used for its transmission, received inter-UE coordination information from UE-A indicating expected/potential resource conflict(s) for the reserved resource(s), and uses it to determine resource re-selection is UE-B*
    - *A UE that detects expected/potential resource conflict(s) on resource(s) indicated by UE-B’s SCI sends inter-UE coordination information to UE-B, subject to satisfy one of the following conditions, is UE-A*
      * *(Working assumption) At least a destination UE of one of the conflicting TBs, i.e., TBs to be transmitted in the expected/potential conflicting resource(s)*
        + *Whether a non-destination UE of a TB transmitted by UE-B can be UE-A is (pre-)configured*
      * *FFS: Additional details and condition(s) on UE-A and UE-B*
    - *The above feature can be enabled or disabled or controlled by (pre-)configuration*
      * *FFS: Details on how to support this, including (pre-)configuration signaling granularity*
    - *FFS: Definition of expected/potential resource conflict(s) and other details (if any)*
* *Agreement:*
  + *In scheme 2, the following UE-B’s behavior in its resource (re)selection is supported when it receives inter-UE coordination information from UE-A:*
    - *UE-B can determine resource(s) to be re-selected based on the received coordination information*
      * *UE-B can reselect resource(s) reserved for its transmission when expected/potential resource conflict on the resource(s) is indicated*
        + *FFS: Other details (if any)*
* *Agreement:*
  + *In scheme 1, at least following UE-B’s behavior in its resource (re-)selection is supported when it receives inter-UE coordination information from UE-A:*
    - *For preferred resource set, the following two options are supported:*
      * *Option A): UE-B’s resource(s) to be used for its transmission resource (re-)selection is based on both UE-B’s sensing result (if available) and the received coordination information*
        + *UE-B uses in its resource (re-)selection, resource(s) belonging to the preferred resource set in combination with its own sensing result*

*UE-B uses in its resource (re-)selection, resource(s) not belonging to the preferred resource set when condition(s) are met*

*FFS: Details of condition(s)*

*This option is supported when UE-B performs sensing/resource exclusion*

*FFS: Other details (if any)*

* + - * *Option B): UE-B’s resource(s) to be used for its transmission resource (re-)selection is based only on the received coordination information*
        + *UE-B uses in its resource (re-)selection, resource(s) belonging to the preferred resource set*

*This option is supported at least when UE-B does not support sensing/resource exclusion*

*FFS: Whether the support is conditional or UE capability*

*FFS: Other details (if any)*

* + - * *FFS: Other option(s), and other details (if any)*
    - *For non-preferred resource set,* 
      * *UE-B’s resource(s) to be used for its transmission resource (re-)selection is based on both UE-B’s sensing result (if available) and the received coordination information* 
        + *UE-B excludes in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set*

*FFS: Details including*

*Whether/how UE-B can use in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set, definition of the overlap, and other details (if any)*

*When UE-B excludes in its resource (re-)selection, resource(s) overlapping with the non-preferred resource set*

* + - * + *FFS: UE-B reselects in its resource (re-)selection, resource(s) to be used for its transmission when the resource(s) are fully/partially overlapping with the non-preferred resource set*
      * *FFS: Other option(s), and other details (if any)*
* *Agreement:*
  + *In scheme 2, at least the following is supported to determine inter-UE coordination information:*
    - *Among resource(s) indicated by UE-B’s SCI, UE-A considers that expected/potential resource conflict occurs on the resource(s) satisfying at least one of the following condition(s):* 
      * *Condition 2-A-1:*
        + *Other UE’s reserved resource(s) identified by UE-A are fully/partially overlapping with resource(s) indicated by UE-B’s SCI in time-and-frequency*
        + *FFS: Other details (if any)*
        + *FFS: Whether/how to specify additional criteria and other details (if any) including signaling details of conflict indication*
      * *(Working Assumption) Condition 2-A-2:* 
        + *Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation*

*FFS: Other details (if any)*

* + - * *FFS: Other condition(s)*
    - *FFS: Other details (if any)*
* *Agreement:*
  + *In scheme 1, at least the following is supported to determine inter-UE coordination information of preferred resource set:*
    - *UE-A considers any resource(s) satisfying all the following condition(s) as set of resource(s) preferred for UE-B’s transmission*
      * *Condition 1-A-1:*
        + *Resource(s) excluding those overlapping with reserved resource(s) of other UE identified by UE-A whose RSRP measurement is larger than a RSRP threshold*

*FFS: Other details (if any)*

* + - * *FFS: Condition 1-A-2:*
        + *Resource(s) excluding slot(s) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B*

*FFS: Other details (if any)*

* + - * *FFS: Condition 1-A-3:*
        + *Resource(s) satisfying UE-B’s traffic requirement (if available)*

*FFS: Other details (if any)*

* + - * *FFS: Other condition(s)*
    - *FFS: Other details (if any)*
* *Agreement:* 
  + *In scheme 1, at least the following is supported to determine inter-UE coordination information of non-preferred resource set:*
    - *UE-A considers any resource(s) satisfying at least one of the following condition(s) as set of resource(s) non-preferred for UE-B’s transmission*
      * *Condition 1-B-1:*
        + *Reserved resource(s) of other UE identified by UE-A from other UEs’ SCI (including priority field) and RSRP measurement*

*FFS: Other details (if any)*

* + - * *FFS: Condition 1-B-2:*
        + *Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B*

*FFS: Other details (if any)*

* + - * *FFS: Other condition(s)*
    - *FFS: Other details (if any)*
  1. **Agreements made in RAN1#106bis-e meeting**
* *Agreement:* 
  + *For Scheme 2, PSFCH format 0 is used to convey the presence of expected/potential resource conflict on reserved resource(s) indicated by UE-B’s SCI*
* *Agreement:* 
  + *For Condition 2-A-1 of Scheme 2, down-select one or more of following additional criteria to determine resource(s) where expected/potential resource conflict occurs*
    - *Option 1: The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) whose RSRP measurement is larger than a RSRP threshold according to the priorities included in the SCI:*
      * *prio\_TX and prio\_RX are the priorities indicated in the SCI making the overlapping reservations*
      * *Strive to reuse Rel-16 specification wherever possible*
    - *Option 2: The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) whose RSRP measurement is within a (pre)configured RSRP threshold compared to the RSRP measurement of UE-B’s reserved resource.* 
      * *FFS: Whether the threshold depends on priority*
    - *Option 3: The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) and the other UE is within a distance threshold of UE-B as determined by both UEs’ SCIs.*
    - *Option 4: The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) whose RSRP measurement is larger a (pre)configured RSRP threshold compared to the RSRP measurement of UE-B’s reserved resource.* 
      * *FFS: Whether the threshold depends on priority*
    - *FFS: In case of collisions of resources for two UEs having TBs with UE A as destination UE, if needed*
* *Working Assumption*
  + *For Condition 1-B-1 of Scheme 1, the following two options are supported*
    - *Option 1: Reserved resource(s) of other UE(s) identified by UE-A whose RSRP measurement is larger than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s)*
    - *Option 2: Reserved resource(s) of other UE identified by UE-A whose RSRP measurement is smaller than a (pre)configured RSRP threshold which is determined by at least priority value indicated by SCI of the UE(s) when UE-A is a destination of a TB transmitted by the UE(s)*
* *Working Assumption*
  + *For Scheme 1 with non-preferred resource set, support following condition:*
    - *Condition 1-B-2:*
      * *Resource(s) (e.g., slot(s)) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation*
* *Agreement:* 
  + *For Condition 1-A-1 of Scheme 1, the set of resources preferred for UE-B’s transmission is a form of candidate single-slot resource as specified in Rel-16 TS 38.214 Section 8.1.4*
    - *When the inter-UE coordination information transmission is triggered by UE-B’s explicit request, the candidate single-slot resource(s) are determined in the same way according to Rel-16 TS 38.214 Section 8.1.4 with at least following parameters provided by signaling from UE-B. FFS whether or not to apply RSRP threshold increase in Step 7) of Rel-16 TS 38.214 Section 8.1.4.*
      * *Priority value to be used for PSCCH/PSSCH transmission* 
        + *It replaces prio\_TX*
      * *Number of sub-channels to be used for PSSCH/PSCCH transmission in a slot*
        + *It replaces L\_subCH*
      * *Resource reservation interval* 
        + *It replaces P\_rsvp\_TX*
      * *FFS: Starting/ending time location of resource selection window*
    - *FFS : In addition to Rel-16 procedure, use inter-UE coordination information from other UEs*
      * *If there is no consensus in RAN1#106bis-e, no further discussions for Rel-17*
* ***Conclusion****:*
  + *No consensus that UE-A uses inter-UE coordination information from other UEs when it determines the preferred resource set for Condition 1-A-1 of Scheme 1.*
* *Working Assumption*
  + *For Scheme 1 with preferred resource set, support following condition:*
    - *Condition 1-A-2:*
      * *Resource(s) excluding slot(s) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation*
      * *This can be disabled by RRC (pre-)configuration*
* *Agreement:* 
  + *For allocating PSFCH resources in Scheme 2, at least following can be (pre)configured separately from those for SL HARQ-ACK feedback.*
    - *Set of PRBs for PSFCH transmission/reception (sl-PSFCH-RB-Set)*
* *Agreement:* 
  + *For Scheme 2,* 
    - *Index of a PSFCH resource for inter-UE coordination information transmission is determined in the same way according to Rel-16 TS 38.213 Section 16.3 with at least following modification*
      * *P\_ID is L1-Source ID indicated by UE-B’s SCI*
      * *M\_ID is 0*
    - *FFS: How to set m\_CS*
    - *FFS: How to set m\_0*
    - *FFS: Whether M\_ID can be (pre)configured*
  1. **Agreements made in RAN1#107-e meeting**
* *Agreement:* 
  + *A resource pool level (pre-)configuration uses either of the following options*
    - *Option 1: PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted*
      * *Reuse PSSCH-to-PSFCH timing as specified in TS 38.213 Section 16.3 to determine the PSFCH occasion for resource conflict indication*
      * *Time gap between the PSFCH and a slot where expected/potential resource conflict occurs is larger than or equal to T\_3*
    - *Option 2: PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI*
      * *UE-A transmits the PSFCH in a latest slot that includes PSFCH resources for inter-UE coordination information and is at least T\_3 slots of the resource pool before the PSSCH resource indicated by UE-B’s SCI in which expected/potential resource conflict occurs*
      * *FFS: How to account for processing timeline*
    - *Note that it is possible not to configure either option1 or option 2.*
* *Agreement:* 
  + *For Condition 1-A-2 of Scheme 1, the set of resources preferred for UE-B’s transmission is a form of candidate single-slot resource as specified in Rel-16 TS 38.214 Section 8.1.4*
    - *UE-A excludes candidate single-slot candidate(s) belonging to “slot(s) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation” after Step 6) of TS 38.214 Section 8.1.4*
* *Agreement:* 
  + *When PSFCH TX/RX for Scheme 2 is overlapping with LTE SL TX/RX and/or UL in a UE, reuse prioritization rule as specified in TS 38.213 Section 16.2.4.1 and 16.2.4.3.1.*
* ***Conclusion****:*
  + *For Scheme 2, the values of the following parameters are the same as those for SL HARQ-ACK feedback in the same resource pool*
    - *Period of PSFCH resources (sl-PSFCH-Period)*
    - *Number of cyclic shift pairs used for a PSFCH transmission that can be multiplexed in a PRB (sl-NumMuxCS-Pair)*
    - *Number of PSFCH resources available for multiplexing information in a PSFCH transmission (sl-PSFCH-CandidateResourceType)*
* *Agreement:* 
  + *For Scheme 1, a resource pool level (pre-)configuration can enable one of the following alternatives:*
    - *Alt 1 (Working Assumption): MAC CE or 2nd SCI are used as the container of inter-UE coordination information transmission from UE A to UE B.*
      * *For the indication of resource set, the following is supported:*
        + *N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.*

*First resource location of each TRIV is separately indicated by the inter-UE coordination information*

* + - * + *If [N <= 3], MAC CE is used and it is up to UE implementation to additionally use 2nd SCI. When 2nd SCI and MAC CE are both used, the same resource set is indicated in the 2nd SCI and the MAC CE. If [N > 3], only MAC CE is used.*

*FFS: UE capability details*

*2nd SCI is UE RX optional*

* + - *Alt 2: MAC CE is used as the container of inter-UE coordination information transmission from UE A to UE B.*
      * *For the indication of resource set, the following is supported:*
        + *N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.*

*First resource location of each TRIV is separately indicated by the inter-UE coordination information*

* + - *FFS: Whether/How to use resource reservation information as coordination information*
* *Working Assumption:*
  + *A resource pool level (pre-)configuration can enable one of the following options:* 
    - *Option 1:*
      * *For Condition 2-A-1 of Scheme 2, support following additional criteria to determine resource(s) where expected/potential resource conflict occurs*
        + *For the case when UE-A is a destination UE of a TB transmitted by UE-B*

*The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) whose RSRP measurement is larger than a RSRP threshold according to the priorities included in the SCI:*

*prio\_TX and prio\_RX are the priorities indicated in the SCI making the overlapping reservations for UE-B and other UE respectively*

* + - * + *For the case when UE-A is a destination UE of a TB transmitted by another UE*

*The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) when RSRP measurement of UE-B’s reserved resource is larger than a RSRP threshold according to the priorities included in the SCI:*

*prio\_TX and prio\_RX are the priorities indicated in the SCI making the overlapping reservations for other UE and UE-B respectively*

* + - *Option 4:*
      * *For Condition 2-A-1 of Scheme 2, support following additional criteria to determine resource(s) where expected/potential resource conflict occurs*
        + *For the case when UE-A is a destination UE of a TB transmitted by UE-B*

*The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) whose RSRP measurement is larger than a (pre)configured RSRP threshold compared to the RSRP measurement of UE-B’s reserved resource.*

* + - * + *For the case when UE-A is a destination UE of a TB transmitted by another UE*

*The resource(s) are fully/partially overlapping in time-and-frequency with other UE’s reserved resource(s) when RSRP measurement of UE-B’s reserved resource is larger than a (pre)configured RSRP threshold compared to the RSRP measurement of the resource(s).*

* + - * *Support of Option 4 is subject to UE capability*
    - *FFS: Whether/how RSRP threshold depends on priority, MCS, overlap*
* *Agreement:* 
  + *For Scheme 1 with non-preferred resource set,* 
    - *Physical layer at UE-B excludes in its resource (re-)selection, candidate single-slot resource(s) obtained after Step 6) of Rel-16 TS 38.214 Section 8.1.4 overlapping with the non-preferred resource set*
* *Agreement:* 
  + *For Condition 1-A-1 of Scheme 1, when UE-A determines the set of resources preferred for UE-B’s transmission, apply RSRP threshold increase in the same way according to Rel-16 TS 38.214 Section 8.1.4.*
    - *FFS: Whether/how to introduce the maximum limit of RSRP threshold increase*
* *Agreement:* 
  + *For Scheme 1, at least following parameters are provided by UE-B’s request:*
    - *Priority value to be used for PSCCH/PSSCH transmission*
    - *Number of sub-channels to be used for PSSCH/PSCCH transmission in a slot*
    - *Resource reservation interval*
* *Agreement:* 
  + *For Scheme 2, when PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI,* 
    - *Time gap between the PSFCH and SCI(s) scheduling conflicting TBs is larger than or equal to X value.* 
      * *FFS: Details of X*
* *Working Assumption:*
  + *For Condition 2-A-1 in Scheme 2, when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is enabled or when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is disabled and the destination UE of the conflicting TBs is UE-A, for each pair of UEs scheduling the conflicting TBs, a UE with the higher priority value is UE-B.*
    - *FFS whether/how to set additional condition for UE-A to send PSFCH.*
    - *Conclude on whether/how to handle, or differently handle, the case when at least one of UEs scheduling conflicting TBs doesn’t support Scheme 2 at the subsequent meetings*
* *Agreement:* 
  + *For inter-UE coordination information triggered by an explicit request in Scheme 1,*
    - *UE-A uses a TX resource pool used for UE-B’s request transmission to determine the set of resources and to transmit the set of resources to UE-B*
* *Agreement:* 
  + *For inter-UE coordination information triggered by a condition rather than request reception in Scheme 1,*
    - *UE-A transmitting in a resource pool provides inter-UE coordination information associated with the same resource pool*
  1. **Agreements made in RAN#94-e meeting**
* *Agreement:* 
  + *RAN1 is tasked to complete the remaining normative work for Rel-17 NR sidelink enhancement by Q1 of 2022*
    - *All RAN1 decisions that impact other WGs should be finalized in RAN1#107bis-e*
  + *Use the list of open issues provided RP-212880 (status report of WI: NR sidelink enhancement) as a starting point for technical discussions in RAN1.* 
    - *This does not mean that all the issues included in the list are considered essential or the list is complete*
    - *RAN1 should not spend additional effort to further refine the list*
  1. **Agreements made in RAN1#107bis-e meeting**
* *Agreement:*
  + *For Scheme 1, when the inter-UE coordination information transmission is triggered by UE-B’s explicit request,* 
    - *Starting/Ending time locations of resource selection window is provided by UE-B’s explicit request*
      * *Starting/Ending time locations of resource selection window is a form of combination of DFN index and slot index*
* *Agreement:*
  + *When PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI, time gap between the PSFCH and SCI(s) scheduling conflicting TBs is larger than or equal to X value*
    - *X = sl-MinTimeGapPSFCH*
  + *UE does not transmit the conflict indicator or receive the conflict indicator if the timeline is not satisfied*
* *Agreement:*
  + *For Scheme 1, a resource pool level (pre-)configuration can enable one of the following alternatives:*
    - *(Working assumption) Alt1: MAC CE and 2nd SCI are used as the container of an explicit request transmission from UE-B to UE-A*
      * *A single format SCI 2-C is used for inter-UE coordination information and request*
        + *1 bit in format 2-C is used to indicate whether the SCI is used for request to coordination information or for conveying coordination information*
      * *SCI 2-C is UE RX optional*
      * *It is up to UE implementation to additionally use 2nd SCI (for UE-B).*
    - *Alt2: MAC CE is used as the container of an explicit request transmission from UE-B to UE-A*
* ***Conclusion****:*
  + *For Scheme 2, there is no consensus to support indication of the following*
    - *Condition type of a resource conflict*
    - *Time location of a resource conflict*
* *Agreement:*
  + *Alt 2-1*
    - *For Scheme 2,* 
      * *The PHY layer reports S\_A after Step 7) of TS 38.214 Section 8.1.4 to higher layer.*
      * *When UE-B receives a conflict indicator for resource(s) indicated by its SCI,*
        + *PHY layer at UE-B reports resources overlapping with the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission to higher layer.*

*If (pre)configured, the PHY layer reports resources in a slot including the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission to higher layer.*

* + - * + *Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.*
      * *FFS: Whether/How the conflict in periodic transmission is indicated by UE-A and handled by UE-B*
* *Agreement:*
  + *For PSFCH TX/RX or TX/TX prioritization in Scheme 2,* 
    - *Priority value of PSFCH TX for a resource conflict indication is the smallest priority value of the conflicting TBs*
    - *Priority value of PSFCH RX for a resource conflict indication is priority value indicated by UE-B’s SCI*
    - *For PSFCH TX/RX or TX/TX prioritization between SL HARQ-ACK feedback(s) and resource conflict indication(s), PSFCH TX/RX for SL HARQ-ACK feedback is always prioritized over PSFCH TX/RX for a resource conflict indication*
* *Agreement:*
  + *For Scheme 1, unicast is supported for an explicit request transmission for inter-UE coordination information*
    - *Unicast is used for the inter-UE coordination information transmission triggered by the explicit request*
* *Working Assumption:*
  + *For Scheme 1, following cast type(s) are supported for inter-UE coordination information transmission triggered by a condition other than explicit request reception*
    - *Groupcast/Broadcast for non-preferred resource set, FFS for preferred resource set*
      * *FFS: Under which conditions groupcast/broadcast can be supported*
    - *Unicast*
      * *FFS: Under which conditions unicast can be supported*
* *Agreement:*
  + *For determining preferred resource set in Scheme 1, the value of Cresel is determined by UE-A according to Rel-16 procedure.*
    - *This information is not conveyed to/from UE-B*
    - *When inter-UE coordination information is triggered by UE-B’s request, P\_rsvp\_TX used for determining SL\_RESOURCE\_RESELECTION\_COUNTER according to Rel-16 procedure is provided by resource reservation interval indicated by UE-B’s request*
* *Agreement:*
  + *For the indication of resource set in Scheme 1, the value of Sl-MaxNumPerReserve is fixed to 3.*
* *Agreement:*
  + *The following working assumption is confirmed with modification in RED.*
    - *MAC CE or 2nd SCI are used as the container of inter-UE coordination information transmission from UE A to UE B.*
      * *For the indication of resource set, the following is supported:*
        + *N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.*

*First resource location of each TRIV is separately indicated by the inter-UE coordination information*

* + - * + *If [N <= 3], MAC CE is used and it is up to UE implementation to additionally use 2nd SCI. When 2nd SCI and MAC CE are both used, the same resource set is indicated in the 2nd SCI and the MAC CE. If [N > 3], only MAC CE is used.*

*FFS: UE capability details*

*2nd SCI is UE RX optional*

*The field size of the indication of resource set in a SCI format 2-C is determined by [N=3]*

* *Agreement:*
  + *For inter-UE coordination information transmission in Scheme 1,* 
    - *Inter-UE coordination information can be multiplexed with other data only if the source/destination ID pair is the same*
      * *Retransmission of the TB carrying inter-UE coordination information is supported*
  + *For explicit request transmission in Scheme 1,* 
    - *Explicit request can be multiplexed with other data only if the source/destination ID pair is the same*
      * *Retransmission of the TB carrying request is supported*
* *Agreement:*
  + *For inter-UE coordination triggered by an explicit request in Scheme 1, whether or not to transmit the inter-UE coordination information upon the request reception is determined by UE-A’s implementation subject to the following procedures.* 
    - *Rel-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control*
* *Agreement:*
  + *For inter-UE coordination triggered by a condition rather than request reception in Scheme 1,* 
    - *A resource pool level (pre-)configuration can enable one of the following alternatives:*
      * *Alt 1: it is up to UE-A’s implementation whether or not to trigger the inter-UE coordination information generation.*
      * *Alt 2: the inter-UE coordination information generation can be triggered only when UE-A has data to be transmitted together with the inter-UE coordination information to UE-B*
    - *Note: Rel-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control is applied to the transmission of the inter-UE coordination information triggered by a condition.*
* *Agreement:*
  + *For inter-UE coordination triggered by UE-B’s explicit request in Scheme 1,* 
    - *A resource pool level (pre-)configuration can enable one of the following alternatives:*
      * *Alt 1: it is up to UE-B’s implementation whether or not to trigger the request generation*
      * *Alt 2: the request generation can be triggered only when UE-B has data to be transmitted to UE-A*
    - *Note: Rel-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control is applied to the transmission of the request transmission.*
* *Agreement:*
  + *For Scheme 1 with preferred resource set Option A,*
    - *MAC layer selects resources using S\_A and the received preferred resource set*
      * *MAC layer firstly selects resources for transmissions within the intersection of S\_A and the preferred resource set until it becomes impossible to select a resource within the intersection under the constraint defined in Rel-16.*
        + *It is up to the UE whether to use the preferred resource set from SCI format 2-C and/or MAC CE*
      * *After this, if the number of selected resources is smaller than the required number of transmissions for a TB, MAC layer selects resources for the remaining transmissions outside the intersection but inside S\_A under the constraint defined in Rel-16.*
* *Agreement:*
  + *For Scheme 1 with preferred resource set Option B,*
    - *MAC layer selects resources belonging to the received preferred resource set under the constraint defined in Rel-16*
      * *It is up to the UE whether to use the preferred resource set from SCI format 2-C and/or MAC CE*
* *Agreement:*
  + *For inter-UE coordination information triggered by an explicit request in Scheme 1, the priority value of the inter-UE coordination information is (pre)configured priority value if it is provided by (pre)configuration. Otherwise, the priority value is the same as indicated by UE-B’s explicit request.*
    - *For the case when inter-UE coordination information is transmitted together with other data, the priority value of the multiplexed sidelink transmission is determined by the smallest priority value between the inter-UE coordination information and data*
* *Agreement:*
  + *For inter-UE coordination information triggered by an explicit request in Scheme 1, the priority value of explicit request is (pre)configured priority value if it is provided by (pre)configuration. Otherwise, the priority value is the same as that of a TB to be transmitted by UE-B.*
    - *For the case when the explicit request is transmitted together with other data, the priority value of the multiplexed sidelink transmission is determined by the smallest priority value between the explicit request and data*
* *Agreement:*
  + *For inter-UE coordination information triggered by a condition other than explicit request reception in Scheme 1, the priority value of the inter-UE coordination information is (pre)configured priority value if it is provided by (pre)configuration.* 
    - *FFS: Otherwise, the priority value is determined by UE-A’s implementation.*
    - *For the case when inter-UE coordination information is transmitted together with other data, the priority value of the multiplexed sidelink transmission is determined by the smallest priority value between the inter-UE coordination information and data*
* *Agreement:*
  + *For sidelink transmission carrying inter-UE coordination information in Scheme 1,* 
    - *UE-A performs its resource (re)selection according to the same procedure in TS 38.214 Section 8.1.4 to transmit the inter-UE coordination information to UE-B.*
  + *For sidelink transmission carrying request in Scheme 1,* 
    - *UE-B performs its resource (re)selection according to the same procedure in TS 38.214 Section 8.1.4 to transmit the request for the inter-UE coordination information to UE-A if UE-B performs sensing/resource exclusion. Otherwise, at least UE-B can perform random selection*
  + *Note: RAN1 does not pursue specific enhancement of Rel-17 resource (re)selection for the transmission of inter-UE coordination information and its request.*
* *Working assumption:*
  + *First resource location of each TRIV is a slot offset with respect to a reference slot*
    - *Alt 2:* 
      * *The slot offset is the number of logical slots from the reference slot*
        + *The value range of slot offsets is from 0 to maximum value that is (pre)configurable up to [256]*

*FFS: The detailed value range including granularity*

* + - * + *Slot offset for each TRIV to indicate the set of resources is separately indicated by inter-UE coordination information*
    - *For the reference slot,* 
      * *The reference slot is the slot indicated by the inter-UE coordination information in a form of combination of DFN index and slot index*
* *Agreement:*
  + *For determining preferred resource set in Scheme 1, when inter-UE coordination information transmission is triggered by a condition other than explicit request reception,*
    - *Values of following parameters are (pre)configured for a resource pool. If there is no (pre)configuration, UE-A determines by its implementation the values of the following parameters*
      * *prio\_TX*
      * *L\_subCH*
      * *P\_rsvp\_TX*
    - *UE-A determines by its implementation values of following parameters* 
      * *n+T\_1, n+T\_2*
    - *FFS: Whether/how to support (pre)configuration of n+T\_1 and n+T\_2*
    - *Note that it is up to RAN2 decision whether/how the values of these parameters are provided by PC5-RRC signaling from UE-B to UE-A and UE-A uses the received information to determine the preferred resource set*
* *Agreement:*
  + *For inter-UE coordination information is triggered by UE-B’s request,* 
    - *A resource pool level (pre-)configuration can enable one of the following alternatives:*
      * *Alt 1:*
        + *Resource set type to be provided by inter-UE coordination information transmission is determined by UE-A’s implementation and its information is indicated by UE-A’s inter-UE coordination information*

*UE-A’s inter-UE coordination information indicates either preferred resource set or non-preferred resource set*

* + - * *Alt 2:*
        + *Resource set type to be provided by inter-UE coordination information transmission is indicated by UE-B’s request*

*UE-B’s request indicates either preferred resource set or non-preferred resource set*

* + - *Note that it is up to RAN2 decision whether/how UE-B provides its support of sensing/resource exclusion to UE-A via PC5-RRC signaling and UE-A uses the received information to determine the type of resource set to be transmitted to UE-B*
* *Agreement:*
  + *For inter-UE coordination information is triggered by a condition other than explicit request reception,* 
    - *Resource set type to be provided by inter-UE coordination information transmission is determined by UE-A’s implementation and its information is indicated by UE-A’s inter-UE coordination information*
      * *UE-A’s inter-UE coordination information indicates either preferred resource set or non-preferred resource set*
* *Working assumption:*
  + *For Scheme 2, (pre)configuration is supported to enable or disable that 1 LSB of reserved bits of a SCI format 1-A is used to indicate of whether UE scheduling a conflict TB can be UE-B or not.*
    - *FFS: UE-A's behavior for the case when at least one of UEs scheduling conflicting TBs is not capable of receiving the conflict indication*
  1. **Agreements made in RAN1#108-e meeting**
* *Agreement:*
  + *For a slot offset that is (pre)configured to indicate the first resource location of each TRIV with respect to a reference slot,*
    - *Granularity of the slot offset is 1 logical slot*
    - *(Pre)configured maximum value of the slot offset is up to 8000*
      * *When both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the maximum value of the slot offset is 255*
      * *When MAC CE only is used as the container of inter-UE coordination information, the maximum value of the slot offset is the (pre)configured maximum value*
* *Agreement:*
  + *A SCI format 2-C includes all the fields present in SCI format 2-A except cast type indicator*
* ***Conclusion****:*
  + *For cast type(s) of inter-UE coordination information with preferred resource set triggered by a condition other than explicit request reception*
    - *There is no consensus in RAN1 on the support of groupcast or broadcast for preferred resource set*
* *Agreement*
  + *For Scheme 2,* 
    - *m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for either current TB transmission or next TB transmission is 0*
* *Agreement*
  + *For Scheme 2, when UE-B receives a conflict indicator for resource(s) indicated by its SCI, it up to UE-B’s implementation whether/how to set the reservation periodicity in the re-selected resource.*
* *Agreement*
  + *For Scheme 2,* 
    - *m\_0 for a resource conflict indication is derived in the same way as specified for HARQ-ACK information in TS 38.213 Section 16.3*
    - *A UE expects that different PRBs are (pre)configured between conflict indication and HARQ-ACK information*
* *Agreement:*
  + *For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of an explicit request for inter-UE coordination information, the same bit field size for the request in a SCI format 2-C is applied to MAC CE*
* *Agreement:*
  + *For Scheme 1, when MAC CE only is used as the container of an explicit request for inter-UE coordination information, the same bit field size for the request in a SCI format 2-C is applied to MAC CE*
* ***Conclusion****:*
  + *For inter-UE coordination operation in Rel-17, RAN1 understands that only UE(s) in mode 2 can be UE-A*
    - *Note that RAN1 does not pursue specific enhancement of Rel-17 inter-UE coordination operation for handling the case where UE(s) in mode 1 can be UE-A*
* *Agreement*
  + *Confirm the following working assumption with modification in RED*
    - *Working assumption made in RAN1#107bis-e:*
      * *First resource location of each TRIV is a slot offset with respect to a reference slot*
        + *Alt 2:*

*The slot offset is the number of logical slots from the reference slot*

*The value range of slot offsets is from 0 to maximum value that is (pre)configurable up to ~~[~~8000~~256]~~*

*~~FFS: The detailed value range including granularity~~*

*Slot offset for each TRIV except for first TRIV to indicate the set of resources is separately indicated by inter-UE coordination information*

*Slot offset for first TRIV is 0*

* + - * + *For the reference slot,*

*The reference slot is the slot indicated by the inter-UE coordination information in a form of combination of DFN index and slot index*

* *Agreement*
  + *MAC CE or 2nd SCI are used as the container of inter-UE coordination information transmission from UE A to UE B.*
    - *For the indication of resource set, the following is supported:*
      * *N combinations of TRIV, FRIV, resource reservation period as specified in Rel-16 TS 38.214 Section 8.1.5 with following modification. The value of resource reservation period is omitted at least when the transmission of preferred resource set is triggered by UE-B’s explicit request.*
        + *First resource location of each TRIV is separately indicated by the inter-UE coordination information*
      * *If N <= 2, MAC CE is used and it is up to UE implementation to additionally use 2nd SCI. When 2nd SCI and MAC CE are both used, the same resource set is indicated in the 2nd SCI and the MAC CE. If N > 2, only MAC CE is used.*
        + *FFS: UE capability details*
        + *2nd SCI is UE RX optional*
        + *The field size of the indication of resource set in a SCI format 2-C is determined by N=2*
* *Agreement*
  + *For Scheme 1, each bit field size of a SCI format 2-C for inter-UE coordination information is given by following table:*
    - *Note that lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information*

|  |  |
| --- | --- |
| *Field name* | *Field size (in bits)* |
| *Providing/requesting indicator* | *1* |
| *Resource combination(s)* | *Where is provided by the higher layer parameter sl-NumSubchannel,*  *with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResource is configured; otherwise.* |
| *First resource location(s)* | *8* |
| *Reference slot location* | *Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively.* |
| *Resource set type* | *1* |
| *Lowest subchannel indices for the first resource location of each TRIV* | *where is provided by the higher layer parameter sl-NumSubchannel* |
| *(FFS) Actual number of resource combination* | *1*  *Note: Support of this field is to be concluded by Feb 28.* |

* *Agreement* 
  + *For Scheme 1, each bit field size of a SCI format 2-C for an explicit request for inter-UE coordination information is given by following table:*

|  |  |
| --- | --- |
| *Field name* | *Field size (in bits)* |
| *Providing/requesting indicator* | *1* |
| *Priority* | *3* |
| *Number of subchannels* | *Where is provided by the higher layer parameter sl-NumSubchannel* |
| *Resource reservation period* | *Where with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResoure is configured; otherwise.* |
| *Resource selection window location* | *Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively.* |
| *Resource set type* | *1 bit if determineResourceSetTypeScheme1 is set to ‘UE-B’s request’, otherwise, 0 bit* |

* + *This agreement does not imply that new field requested by RAN2 cannot be further added.*
* *Agreement* 
  + *For Scheme 1, when MAC CE only is used as the container of inter-UE coordination information, each bit field size for inter-UE coordination information is given by following table from RAN1’s perspective, and RAN1 understands that the maximum value of N resource combinations to be conveyed in inter-UE coordination information is bounded so that the total payload size of inter-UE coordination information leads not to exceed the size of TB including the MAC CE*
    - *Details (e.g., whether/how to separately indicate the value of N in the inter-UE coordination information, how to put the following fields into MAC CE and the related field sizes in MAC CE) are up to RAN2*

|  |  |
| --- | --- |
| *Field name* | *Field size (in bits)* |
| *Providing/requesting indicator* | *1* |
| *Resource combination(s)* | *Where is provided by the higher layer parameter sl-NumSubchannel,*  *with that is the number of entries in the higher layer parameter sl-ResourceReservePeriodList, if higher layer parameter sl-MultiReserveResoure is configured; otherwise.* |
| *First resource location(s)* | *Where X is provided by the (pre)configured maximum value of slot offset for the case when MAC CE only is used as a container of inter-UE coordination information* |
| *Reference slot location* | *Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively.* |
| *Resource set type* | *1* |
| *Lowest subchannel indices for the first resource location of each TRIV* | *Where is provided by the higher layer parameter sl-NumSubchannel.* |

* ***Conclusion****:*
  + *There is no consensus in RAN1 on indicating actual number of resource combination in a SCI format 2-C for inter-UE coordination information.* 
    - *Note: Different resource combinations can indicate the same set of resources for the case when only one resource combination is actually used*
* *Agreement* 
  + *For Scheme 2,* 
    - *The PHY layer reports S\_A after Step 7) of TS 38.214 Section 8.1.4 to higher layer.*
    - *When UE-B receives a conflict indicator for resource(s) indicated by its SCI,*
      * *PHY layer at UE-B reports resources overlapping with the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.*
        + *If (pre)configured, the PHY layer reports resources in a slot including the next reserved resource indicated by the corresponding UE-B’s SCI ~~for current TB transmission~~ to higher layer.*
      * *Higher layer at UE-B re-selects the resource(s) indicated by the conflict indicator among the S\_A excluding the reported resources.*
* *Agreement* 
  + *Confirm the following working assumption with modification in RED/BLUE. Note that the terminology of “indicationUEB flag” means the indication of whether UE scheduling a conflict TB can be UE-B or not.*
    - *Working Assumption:*
      * *For Condition 2-A-1 in Scheme 2, when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is enabled or when “a non-destination UE of a TB transmitted by UE-B can be UE-A” is disabled and the destination UE of the conflicting TBs is UE-A,* 
        + *for each pair of UEs scheduling the conflicting TBs whose PSFCH occasions for resource conflict indication are not yet passed and indicationUEB flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, a UE with the higher priority value is UE-B. When the UEs in the pair have the same priority value, UE-A determines one of the UEs to be UE-B by its implementation.*

*UE-A considers the SCIs received earlier than or equal to sl-MinTimeGapPSFCH before the PSFCH occasion for conflict indication when determining UE-B.*

* *Agreement* 
  + *A UE performs PSFCH TX/RX or TX/TX prioritization between SL HARQ-ACK feedback(s) and resource conflict indication(s) first, and then the UE performs prioritization between prioritized PSFCH TX(s) or RX(s) and LTE SL TX/RX or UL by reusing prioritization rule as specified in TS 38.213 Section 16.2.4.1 and 16.2.4.3.1.*
* ***Conclusion****:*
  + *RAN1 does not pursue specific enhancement of Rel-17 inter-UE coordination operation for handling the overlapping between UL with SL-HARQ-ACK information and PSFCH for a conflict indication, i.e., there is no case in Rel-17 where the overlapping between UL with SL-HARQ-ACK information and PSFCH for a conflict indication occur at a UE performing inter-UE coordination operation*
* ***Conclusion****:*
  + *There is no consensus in RAN1 to further introduce enhancement in Rel-17 on Mode 2 resource selection procedure to ensure the timeline (i.e., minimum time gap between PSFCH and a slot where a SCI is transmitted of sl-MinTimeGapPSFCH, minimum time gap between PSFCH and a slot where expected/potential resource conflict occurs on PSSCH resource indicated by a SCI of T\_3) for a conflict indication.*
* *Agreement* 
  + *For Scheme 1, when both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, the same inter-UE coordination information is indicated in the SCI format 2-C and the MAC CE* 
    - *Details (e.g., how to put the fields of SCI format 2C for inter-UE coordination information into MAC CE and the related field sizes in MAC CE) are up to RAN2*