**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 #2 for AI 8.11.1.2 Inter-UE coordination for Mode 2 enhancements

**Document for:** Discussion and information

1. **Draft proposals for 2nd email discussion (Due: February 23rd 10:59am UTC )**
   1. **Scheme 2**

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| Q12-1: Which option(s) is preferred for UE-A’s behavior of sending a resource conflict indicator to UE-B?   * Option 1: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0.   + Note that for this option, UE-A does not transmit a resource conflict indicator for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission. * Option 2: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0. m\_CS for a resource conflict indication for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission is 6. * Option 3: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0. m\_CS for a resource conflict indication for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission is 0. * Option 4: Others (please specify it)   **FL’s observation of 1st email discussion:**   * Option 1: Intel, Futurewei, Samsung, ETRI, LGE, Fujitsu, Panasonic, ZTE, vivo, Ericsson, OPPO, xiaomi, (12) * Option 2: Intel, InterDigital, Qualcomm, Apple, Fraunhofer, Spreadtrum, Nokia, Huawei, CATT, (9) * Option 3: Samsung, Qualcomm, DCM, xiaomi, (4) * Option 4: |

Q1: Do you agree following draft proposal?

Draft proposal:

For Scheme 2,

* m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0.
  + Note: UE-A does not transmit a resource conflict indicator for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission.

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| Company | Yes or no | Comments |
| NTT DOCOMO | Accept | “next TB transmission” seems to be a bit ambiguous.  Should be updated as “transmissions of other TB”. |
| Apple | No | The restriction (no resource conflict indicator for the reserved resource for next TB) in “Note” will largely increase the collision chance in the system. The collision on the initial transmission in each period cannot be avoided by this restriction.  We still prefer Option 2 to support the conflict indication of next TB. A possible compromise solution is that “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 another TB transmission is 0.” |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q12-2: Do you agree following draft proposal for the UE-B’s behavior of setting the value of resource reservation periodicity for the re-selected resources due to the resource conflict indicator reception in case of UE-B’s periodic transmission?  Draft proposal:   * 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.   **FL’s observation of 1st email discussion:**   * Yes: Intel, Futurewei, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Spreadtrum, OPPO, Nokia, Huawei, Lenovo, xiaomi, CATT, (20) * No: Samsung, (1) |

Q2: Do you agree following draft proposal?

Draft proposal:

* 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.

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| Company | Yes or no | Comments |
| NTT DOCOMO | Yes |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q13: Do you agree following draft proposal for m\_0 determination in Scheme 2?  Draft proposal:   * 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   **FL’s observation of 1st email discussion:**   * Yes: Samsung, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, xiami, CATT, * No:   + Do not support 2nd sub-bullet: Futurewei, |

Q3: Do you agree following draft proposal?

Draft proposal:

* 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

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| Company | Yes or no | Comments |
| NTT DOCOMO | Yes |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q14: Do you agree following draft proposal for UE-B determination in Scheme 2?  Draft proposal:   * Confirm the following working assumption with modification in RED:   + 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 Second UE 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 Second UE flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.   **FL’s observation of 1st email discussion:**   * Yes: Qualcomm, LGE, Fujitsu, Panasonic, DCM, Spreadtrum, OPPO, Huawei, Spreadtrum, CATT, (10) * No: Futurewei, Samsung, Apple, (3)   + Do not change the WA: Samsung, (1)   + If PSFCH occasion is derived by a slot where UE-B’s scheduling SCI is transmitted, a UE which sends scheduling SCI in a later slot is UE-B: Apple, (1) |

Q4: Do you agree following draft proposal?

Updated Draft proposal:

* Confirm the following working assumption with modification in RED:
  + 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 Second UE 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 Second UE flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.
      * Note: A UE not satisfying the timeline (i.e., minimum time gap between PSFCH and SCI(s) scheduling conflicting TBs, minimum time gap between PSFCH and a slot where expected/potential resource conflict occurs) is not considered as UE-B.

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| Company | Yes or no | Comments |
| NTT DOCOMO | Yes |  |
| Apple |  | We are generally fine with the direction of the newly added note.  One follow-up is the minimum time gap between PSFCH and SCI scheduling conflicting TBs, and the minimum time gap between PSFCH and conflicting slot) need to be clarified/defined in the proposal (e.g., *sl-MinTimeGapPSFCH*). |
| Panasonic | Yes |  |
| ETRI | Yes |  |

Q5: For the case when at least one of UEs scheduling conflicting TBs is not capable of receiving the conflict indication, companies provide views on whether/how additional enhancement is necessary on top of the updated draft proposal in Q4? If yes, please specify it.

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| Company | Yes or no | Comments |
| NTT DOCOMO | No |  |
| Apple | Yes | We may also discuss the case where both UEs, scheduling the conflict TB, do not have the capability of receiving IUC scheme 2. In this case, no UE is UE-B. |
| Panasonic | No |  |
| ETRI | No |  |

Q6: Regarding following agreements, FL understands that 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. Do you have different understanding? If yes, please specify it.

* *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.*
* *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*

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| Company | Yes or no | Comments |
| NTT DOCOMO | Yes | Prioritization in NR-SL should be performed first. |
| Apple | No | In our understanding, the current specification does not support the prioritization between PSFCH with IUC and PSFCH with SL HARQ first.  Instead, TS 38.213 section 16.2.4.1 and section 16.2.4.3.1 indicate that the prioritization among PSFCH with IUC, PSFCH with SL HARQ, and LTE SL/Uu are determined in one shot. This prioritization is purely depending on the priority value. This may lead to the case PSFCH with IUC is prioritized over PSFCH with SL HARQ, based on their priority values. This prioritization result should be avoided.  One possible solution is at the end of prioritization procedure in section 16.2.4.1 and section 16.2.4.3.1, an additional step is added to prioritize PSFCH with SL HARQ over PSFCH with IUC if possible. |
| Panasonic |  | We have same understanding. |
| ETRI | No | Agree with FL’s understanding. However, it seems necessary to clarify the procedure in the specification |

Q7: Regarding following agreement, FL understands that the meaning of “next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission” is as follows. Do you have different understanding? If yes, please specify it.

* When PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted, the earliest reserved resource indicated by the SCI
* When PSFCH occasion is derived by a slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B’s SCI, the earliest reserved resource indicated by UE-B’s SCI after PSFCH occasion for receiving a conflict indicator for resource(s) indicated by the SCI
* *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*

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| Company | Yes or no | Comments |
| NTT DOCOMO | No | For the 2nd bullet, we have the same understanding. There would be no other understanding.  But for the 1st bullet, there are two issues.  - Processing time issue  We have the following agreement.   |  | | --- | | * 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: (Omitted)     - Note that it is possible not to configure either option1 or option 2. |   Here, the resource with collision shall be at slot T\_3 later than the PSFCH. But in the following situation, with the FL’s understanding, the next reserved resource is the 2nd resource with blue. The above FL’ understanding seems not aligned with the agreement’s intention.    - Unreasonable way of the “next” mechanism  Even without the above processing time-related issue, we should consider the following situation. Here, with the FL’s understanding, the next reserved resource is not involved with collision, while the later reserved resource is involved. This is quite strange direction for us. |
| Apple |  | We are open to discuss the issue related to processing time. |
| Panasonic |  | For first bullet, “the earliest reserved resource indicated by the SCI“ should be replaced to “the earliest reserved resource indicated by UE-B’s SCI after PSFCH occasion for receiving a conflict indicator for resource(s) indicated by the SCI” is also necessary” as same as 2nd bullet. |
| ETRI |  | Tend to agree with NTT DOCOMO, further clarification might be necessary |

Q8: Do you support additional enhancement on Mode 2 RA to ensure the timeline (i.e., minimum time gap between PSFCH and SCI(s) scheduling conflicting TBs, minimum time gap between PSFCH and a slot where expected/potential resource conflict occurs) for a conflict indication?

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| Company | Yes or no | Comments |
| NTT DOCOMO | No | We do not see any further issue so far |
| Apple | Yes | We are fine to discuss this minimum time gap. |
| ETRI | No |  |

* 1. **Scheme 1**

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| Q1-1: Do you support a mechanism of (pre)configuring parameters related to n+T\_1 and n+T\_2 in addition to that UE-A determines these values by its implementation as per agreement?  **FL’s observation of 1st email discussion:**   * Yes: Intel, Futurewei, Ericsson, Lenovo, (4) * No: Samsung, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, CMCC, Spreadtrum, OPPO, Nokia, Huawei, Xiaomi, CATT, (20) |

Q9: Do you agree the following conclusion?

Draft conclusion:

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.

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Support |  |

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| Q11-1: Do you agree to 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 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*   **FL’s observation of 1st email discussion:**   * Yes: Futurewei, Samsung, Qualcomm, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, DCM, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT, (18) |

Q10: Do you agree the following draft proposal?

Draft proposal:

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 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*

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q2: Which option is preferred in terms of indicating frequency resource in the first resource location of each TRIV?   * Option 1: Lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information * Option 2: Resources in the first resource location of each TRIV are not used for indicating the set of resources in inter-UE coordination information (i.e., no support of indicating lowest subchannel index for the first resource location of each TRIV)   **FL’s observation of 1st email discussion:**  Option 1: Intel, Qualcomm, ETRI, Apple, Panasonic, ZTE, NEC, vivo, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Xiaomi, CATT, (15)  Option 2: Futurewei, Samsung, InterDigital, Qualcomm, LGE, Fujitsu, NEC, DCM, Nokia, Huawei, (10) |

Q11: Do you agree the following draft proposal?

Draft proposal:

* For Scheme 1,
  + Lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information
    - Bit field size for this indication in a SCI format 2-C is where is provided by the higher layer parameter sl-NumSubchannel

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| Company | Yes or no | Comments |
| NTT DOCOMO | Accept | But we need to consider this to decide N value below. |
| Apple | Yes | This signaling indication is straightforward and efficient. |
| Panasonic | Yes |  |
| ETRI | Yes | Also fine with N=2 |

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| Q3-1: Do you agree following bit field size of a SCI format 2-C for each content of inter-UE coordination information? If you have different view on the payload size, please specify the value with target row. Note that the maximum number of resource combinations is assumed to be 2 and the maximum slot offset value for first resource location indication is assumed to be 255 in order to align with the draft proposals in section 1.1. The “Note” in the following table is just informative part (i.e., will not be included in the part of agreement).   |  |  |  |  | | --- | --- | --- | --- | | Row | Field name | Field size (in bits) | Note: Maximum number of bits | | 0 | Providing/requesting indicator | 1 | 1 | | 1 | Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel, is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. | 2\*(13+9+4) | | 2 | First resource location(s) |  | 2\*8 | | 4 | Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. | 10+7 | | 5 | Resource set type | 1 | 1 |   **FL’s observation of 1st email discussion:**   * Yes: Futurewei, InterDigital, Qualcomm, ETRI, LGE, Fujitsu, Panasonic, ZTE, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, Lenovo, Xiaomi, CATT, (18)   + Put bit field sizes related to the number of combinations with square bracket: Futurewei, Qualcomm, Ericsson, Nokia, (4)   + Add bit field size for the lowest subchannel index for first resource location if agreed: ETRI, OPPO, Nokia, CATT, (4) * No: Samsung, Apple, vivo, (3)   + Remove first resource location for first TRIV: Samsung, vivo, (2)   + Resource set type size depending on a combination of (pre)configurations: Apple, (1) |

Q12: Do you agree the following draft proposal?

Draft proposal:

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

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| Row | Field name | Field size (in bits) |
| 0 | Providing/requesting indicator | 1 |
| 1 | Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel, is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. |
| 2 | First resource location(s) |  |
| 4 | Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| 5 | Resource set type | 1 |

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | No | 1. Depending on Proposal for Q11, we may need to indicate the lowest sub-channel index of the first resource location of each TRIV in the table, which is (N\*5) bits.  2. Note that although a maximum of 2 (or 3) combinations of (TRIV, FRIV, periodicity) is allowed to be contained in SCI format 2-C, it is possible that each SCI format 2-C contains either 1 combination or 2 combinations. Hence, we need to have a scheme to indicate the actual number of combinations carried in SCI format 2-C. It is possible to have an extra bit field in SCI format 2-C for this indication. We are open to other indication schemes. But before agreeing on the indication schemes of actual N, we need to keep the SCI format 2-C field design open.  If the majority companies think the resource set type is fixed to 1 bit, we can compromise on this field size for the sake of progress. Here, we want to note that this flexible field size does not increase UE’s decoding complexity, since the field size is based on resource pool (pre)configuration. |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q3-2: Do you agree following bit field size of a SCI format 2-C for each contents of an explicit request for inter-UE coordination information? If you have different understanding on the payload size, please specify the value with target row. The “Note” in the following table is just informative part (i.e., will not be included in the part of agreement).   |  |  |  |  | | --- | --- | --- | --- | | Row | Field name | Field size (in bits) | Note: Maximum number of bits | | 0 | Providing/requesting indicator | 1 | 1 | | 1 | Priority | 3 | 3 | | 2 | Number of subchannels | Where is provided by the higher layer parameter sl-NumSubchannel | 5 | | 3 | Resource reservation period | Where is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. | 4 | | 4 | Resource selection window location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. | 2\*(10+7) | | 5 | Resource set type | 1 bit if determineResourceSetTypeScheme1 is set to ‘UE-B’s request’, otherwise, 0 bit |  |   **FL’s observation of 1st email discussion:**   * Yes: Futurewei, InterDigital, Qualcomm, ETRI, LGE, Fujitsu, Panasonic, ZTE, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT, (17) * No: Samsung, Apple, vivo, (3)   + Include zone ID: Samsung, (1)   + Ending time is relative to the starting time: Samsung, vivo, (2)   + Latency bound: Apple, (1) |

Q13: Do you agree the following draft proposal?

Draft proposal:

* 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:

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| Row | Field name | Field size (in bits) |
| 0 | Providing/requesting indicator | 1 |
| 1 | Priority | 3 |
| 2 | Number of subchannels | Where is provided by the higher layer parameter sl-NumSubchannel |
| 3 | Resource reservation period | Where is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. |
| 4 | Resource selection window location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| 5 | Resource set type | 1 bit if determineResourceSetTypeScheme1 is set to ‘UE-B’s request’, otherwise, 0 bit |

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple |  | Q20 is about the latency bound of IUC, which may be indicated in explicit request. We may leave this field open, depending on the discussion of Q20. |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q11-2: Do you agree following draft proposal for the maximum number of combinations to be conveyed on a SCI format 2-C?  Draft proposal:   * For following agreement, remove square brackets with replacing 3 with 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 1st email discussion:**   * Yes: Qualcomm, Apple, LGE, Fujitsu, Panasonic, NEC, DCM, Ericsson, Spreadtrum, OPPO, Huawei, CATT, (12) * Discuss it later: Futuerwei, Samsung, ZTE, Fraunhofer, CMCC, Nokia, xiaomi, (7) |

Q14: Do you agree the following draft proposal?

Draft proposal:

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

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| ***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]* |

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes | The fields copied from SCI 2-A have size 33 bits. According to proposal in Q12, the field size for 2 combinations is 87 bits. The existing fields are already 120 bits. This does not count the indication of lowest sub-channel index of each TRIV.  We do not have more spaces for the third combination, which is at least 34 bits (not counting the indication of lowest sub-channel index).  Even with some proposed optimizations, we cannot fit the 140 bits limitation with the third combination. |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q4-1: When both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, do you agree that the same bit field size of each content of inter-UE coordination information in a SCI format 2-C is applied to MAC CE?  **FL’s observation of 1st email discussion:**   * Yes: Futurewei, Samsung, InterDigital, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Huawei, xiaomi, CATT, (19) * No: Intel, Qualcomm, Nokia, (3)   + SCI format 2-C may indicate subset of feedback resources and SCI-Format 2C content can be re-evaluated: Intel, (1)   + Signaling size can be different: Qualcomm, Nokia, (2) |

Q15: Do you agree the following draft proposal?

Draft proposal:

* 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

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| Company | Yes or no | Comments |
| NTT DOCOMO |  | With the different X, different N is necessary; otherwise there is no reason to use different X. Is it incorrect? |
| Apple |  | MAC CE may indicate N combinations as well.  If both SCI 2-C and MAC CE are used as container, it is possible N is indicated by both SCI 2-C and MAC CE. But the value range of N may be different. In SCI 2-C, only 1 bit is needed to indicate N, while in MAC CE, to achieve the uniform design, more bits are needed to indicate N. |
| Panasonic | Yes |  |
| ETRI | Yes with clarification | Even though the bit field size for first resource location(s) of MAC CE is different from one of SCI, the signaling range is limited to 255 in case that both SCI and MAC CE are the container of IUC information |

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| Q4-2: When both SCI format 2-C and MAC CE are used as the container of an explicit request for inter-UE coordination information, do you agree that the same bit field size of each content of the request in a SCI format 2-C is applied to MAC CE?  **FL’s observation of 1st email discussion:**   * Yes: Intel, Futurewei, Samsung, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT, (22) * No: Lenovo, (1)   + MAC CE maybe used to send additional information: Lenovo, (1) |

Q16: Do you agree the following draft proposal?

Draft proposal:

* 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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic |  | If “the same bit field size for the request in a SCI format 2-C” doesn’t include padding bits, we support the proposal. |
| ETRI | Yes |  |

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| Q4-3: When MAC CE only is used as a container of inter-UE coordination information, please specify how to determine the number of combinations N in inter-UE coordination information in MAC CE (e.g., whether the bit field size of “resource combination(s)” or “first resource location(s)” is changed depending on the actual number of resource combinations to be conveyed by MAC CE, whether the maximum value of N is bounded by the size of a TB including the MAC CE to be transmitted).  **FL’s observation of 1st email discussion:**   * Bit field sizes related to the number of resource combinations:   + Varying depending on the number of resource combinations to be conveyed in inter-UE coordination information     - Supported by Futurewei, Qualcomm, ETRI, Apple, LGE, ZTE, DCM, Spreadtrum, Nokia, Huawei, CATT, (11)       * Indicating the number of resource combinations separately in inter-UE coordination information: Futurewei, Qualcomm, ETRI, Apple, ZTE, Spreadtrum, Nokia, CATT, (8)       * It is up to RAN2 decision how to express how many resource combinations are conveyed by inter-UE coordination information: LGE, DCM, Huawei, (3)       * (pre)configured: Lenovo, (1)   + Varying depending on TB size multiplexed with the MAC CE and priority of the data     - Supported by InterDigital, (1)   + Up to RAN2     - Supported by Ericsson, CMCC, (2) * Maximum number of resource combinations:   + Derived based on maximum MAC CE size: Intel, ZTE, xiaomi, (3)   + Derived based on maximum TB size: LGE, ZTE (2)   + 128: Qualcomm, (1)   + (pre)configured value: vivo, Fraunhofer, (2)   + No need to specify it: OPPO, (1) |

Q17: Do you agree the following draft proposal?

Draft proposal:

* 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, 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) are up to RAN2

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| Row | Field name | Field size (in bits) |
| 0 | Providing/requesting indicator | 1 |
| 1 | Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel, is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. |
| 2 | 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 |
| 4 | Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. |
| 5 | Resource set type | 1 |
| [6] | [Lowest subchannel index(s) for first resource location(s)] | [  Where is provided by the higher layer parameter sl-NumSubchannel] |

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q4-4: When MAC CE only is used as a container of an explicit request for inter-UE coordination information, do you agree that the same bit field size of each content of the request in a SCI format 2-C is applied to MAC CE?  **FL’s observation of 1st email discussion:**   * Yes: Futurewei, Samsung, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT, * No: InterDigital, Lenovo,   + Slot offset value is (pre)configured value: InterDigital, |

Q18: Do you agree the following draft proposal?

Draft proposal:

* 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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q5: Which option is preferred for the additional condition that a SCI format 2-C can be used as a container of inter-UE coordination information?   * Option 1: No further restriction is introduced * Option 2: A SCI format 2-C can convey only preferred resource set * Option 3: A SCI format 2-C can be used only if inter-UE coordination information is not multiplexed with other data * Option 4: A SCI format 2-C can be used only when cast type of inter-UE coordination information transmission is unicast regardless of whether it is multiplexed with other data or not * Option 5: Others (please specify it)   **FL’s observation of 1st email discussion:**   * Option 1: Futurewei, InterDigital, ETRI, Apple, Fujitsu, Panasonic, Fraunhofer, Ericsson, Spreadtrum, Nokia, Huawei, Lenovo, xiaomi, (13) * Option 2: Intel, (1) * Option 3: Qualcomm, (1) * Option 4: LGE, ZTE, vivo, DCM, CMCC, OPPO, CATT, (7) * Option 5:   + Support a SCI format 2-C only case: Samsung, (1) |

Q19: RAN1 already agreed that a SCI format 2-C does not include “**cast type indicator**”. FL understands that it is difficult for a SCI format 2-C to be used for all the cast types (unicast/groupcast/broadcast). In other words, it seems necessary to have a restriction on supported cast type for using a SCI format 2-C. Please provide companies views on this (e.g., how option 1 can work for all the cast types, whether to adopt Option 4 as compromise).

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| Company | Supported cast type(s) | Comments (including any other restriction) |
| NTT DOCOMO | Unicast | Same understanding with FL. |
| Panasonic | Unicast |  |
| ETRI | Unicast | Agree with FL’s explanation |

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| According to RAN2 LS R1-2200880, RAN2 already agreed that “**IUC issues (on which) RAN2 starts discussion: Timer to handle latency bound for inter-UE coordination**”. FL understands that RAN1 does not need to have duplicated discussion for this issue.  Q6: If companies have different understanding on the above FL’s understanding for the issue of introducing latency bound for the inter-UE coordination information, please specify it.  **FL’s observation of 1st email discussion:**   * Discuss latency bound in RAN1: Intel, Futurewei, Qualcomm, Apple, vivo, xiaomi, CATT, (7) * Discuss latency bound in RAN2 as per LS from RAN2: Samsung, Panasonic, NEC, DCM, Ericsson, OPPO, Huawei, Lenovo, (8) |

Q20: Do you agree the following draft conclusion?

Draft conclusion:

* 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 |
| NTT DOCOMO | OK |  |
| Apple | No | Since this latency bound has impact on SCI 2-C format design, we prefer to discuss it in RAN1. |
| Panasonic | Yes |  |

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| Q8: Which option is preferred for sensing window for determining the set of resources?   * Option 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. * Option 2: Sensing window for determining the set of resources starts at n-T\_0-T\_proc,1 and ends at n-T\_proc,0-T\_proc,1 where n is the slot location of UE-A’s inter-UE coordination information transmission * Option 3: Sensing window for determining the set of resources starts at n-T\_0-T\_3 and ends at n-T\_proc,0-T\_3 where n is the slot location of UE-A’s inter-UE coordination information transmission * Option 4: Sensing window for determining the set of resources ends at n-T\_proc,0-T\_proc,1 where n is the slot location of the beginning of a resource selection window for UE-A’s inter-UE coordination information transmission * Option 5: Others (please specify it)   **FL’s observation of 1st email discussion:**   * Option 1: Intel, Samsung, InterDigital, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, CMCC, Spreadtrum, OPPO, Lenovo, xiaomi, CATT, (20) * Option 2: Huawei, (1) * Option 3: Samsung, xiaomi, (2) * Option 4: * Option 5:   + End of sensing window is Tr ealier than n+T\_1 indicated by UE-B’s request: Futurewei,   + Condition of skipping inter-UE coordination information based on sensing status: Ericsson,   + Option 1+ For inter-UE coordination information triggered by a condition other than explicit request reception, n is the slot of the inter-UE coordination information transmission: Qualcomm, |

Q21: Do you agree the following draft conclusion?

Draft conclusion:

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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| Q9: Which option is preferred 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?   * Option 1: No further decision is necessary. * Option 2: UE-A determines the priority value by its implementation. * Option 3: UE-A determines the priority value by its implementation with (pre)configured lower limit. * Option 4: The priority value is fixed to 8. * 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. * Option 6: Others (please specify it).   **FL’s observation of 1st email discussion:**   * Option 1: Intel, Samsung, Qualcomm, ETRI, Apple, LGE, ZTE, NEC, vivo, DCM, Spreadtrum, OPPO, Lenovo, CATT, (14) * Option 2: Futurewei, Fujitsu, Nokia, Huawei, xiaomi, (5) * Option 3: Panasonic, (1) * Option 4: Intel, Qualcomm, ETRI, DCM, Ericsson, Spreadtrum, (6) * Option 5: CMCC, Nokia, (2) * Option 6:   + Default value: Intel, (1)   + Priority value indicated by the latest UE-B’s SCI: InterDigital, Fraunhofer, (2)   + Priority of other data to be multiplexed with inter-UE coordination information: Ericsson, (1) |

Q22: Do you agree the following draft conclusion?

Draft conclusion:

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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| According to RAN2 LS R1-2200880, RAN2 already agreed that “**Inter-UE coordination (IUC) issues (on which) RAN2 mainly relies on RAN1: Cast types (UC/GC/BC) of inter-UE coordination**”. Considering this RAN2 agreement, FL understands that RAN1 needs to have further discussion on FFS points of the following WA.   |  | | --- | | *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* |   Q10: Which option is preferred for the conditions for cast type(s) of inter-UE coordination information transmission triggered by a condition other than explicit request reception?   * Option 1: Only cast type(s) available at UE-A for other data transmission can be used for cast type(s) for the inter-UE coordination information transmission   + Note: it is applied to both when the inter-UE coordination information is multiplexed with other data and when the inter-UE coordination information is not multiplexed with other data * Option 2: Others (please specify it)   **FL’s observation of 1st email discussion:**   * Option 1: Intel, InterDigital, Qualcomm(when inter-UE coordination information is multiplexed with other data), LGE, Fujitsu, ZTE, vivo(for non-preferred resource set), Spreadtrum, OPPO, Nokia, Lenovo, xiaomi, CATT, (13) * Option 2:   + Additional (pre)configuration enabling groupcast inter-UE coordination information: Samsung, (1)   + Unicast is used only when UE-A has data to be multiplexed and transmitted to UE-B: Samsung, CMCC, (2)   + Only unicast is used when inter-UE coordination information is not multiplexed with other data: Qualcomm, (1)   + Do no need to specify: Apple, DCM, Fraunhofer, Huawei, (4)   + Restrict the use of non-preferred resources based on distance between UE-A and UE-B: Ericsson, (1) |

Q23: Do you agree the following draft conclusion?

Draft conclusion:

* Only cast type(s) available at UE-A for other data transmission can be used for cast type(s) for the inter-UE coordination information transmission triggered by a condition other than explicit request reception
  + Note: it is applied to both when the inter-UE coordination information is multiplexed with other data and when the inter-UE coordination information is not multiplexed with other data
  + Note: UE-A determines the cast type(s) of inter-UE coordination information by its implementation among the available cast type(s)

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| Company | Yes or no | Comments |
| NTT DOCOMO | Accept |  |
| Apple |  | We still do not see the need of this conclusion, but we can live with it. |
| Panasonic | OK |  |

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| Q7-1: When UE-B receives multiple preferred resource sets from the same UE-A, what is UE-B’s behavior?   * 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. * Option 2: UE-B determines one of the received preferred resource sets from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the UE-A. * Option 3: UE-B does not expect to receive more than one preferred resource sets from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A. * Option 4: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: Samsung, InterDigital, Qualcomm, Panasonic, DCM, Ericsson, OPPO, Nokia, (8)   + Option 2: LGE, vivo, (2)   + Option 3: Futurewei, Apple, LGE, NEC, CMCC, Spreadtrum, Lenovo, xiaomi, CATT, (9)   + Option 4:     - Feedback aging criteria is used: Intel, (1)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1)     - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer, (1) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: Futurewei, Samsung, InterDigital, Qualcomm, Panasonic, NEC, DCM, Ericsson, Spreadtrum, OPPO, Nokia, CATT, (12)   + Option 2: Apple, LGE, vivo, Leonovo, (4)   + Option 3: CMCC, xiaomi, (2)   + Option 4:     - Feedback aging criteria is used: Intel, (1)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1)     - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer, (1) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: Futurewei, InterDigital, Qualcomm, Panasonic, NEC, Ericsson, Spreadtrum, OPPO, (8)   + Option 2: LGE, vivo, Lenovo, (3)   + Option 3:   + Option 4:     - Feedback aging criteria is used: Intel, (1)     - Not support this case: Samsung, Apple, Nokia, xiaomi, (4)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1)     - Preferred resources corresponding to explicit request should be used preferentially: DCM, CMCC, CATT, (3)     - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer, (1)   Q7-2: When UE-B receives multiple non-preferred resource sets from the same UE-A, what is UE-B’s behavior?   * Option 1: UE-B uses the latest received non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A. * Option 2: UE-B determines one of the received non-preferred resource sets from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the UE-A. * Option 3: UE-B determines a final non-preferred resource set by combining 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. * Option 4: UE-B does not expect to receive more than one non-preferred resource sets from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A. * Option 5: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: Samsung, InterDigital, Ericsson, OPPO, Nokia, (5)   + Option 2: LGE, vivo, (2)   + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC, (6)   + Option 4: Futurewei, Apple, NEC, Spreadtrum, Lenovo, xiaomi, CATT, (7)   + Option 5:     - Feedback aging criteria is used: Intel, (1)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: Futurewei, Samsung, InterDigital, NEC, Ericsson, Spreadtrum, OPPO, Nokia, CATT, (9)   + Option 2: Apple, LGE, vivo, Lenovo, (4)   + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC, (6)   + Option 4: xiaomi, (1)   + Option 5:     - Feedback aging criteria is used: Intel, (1)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: Futurewei, InterDigital, NEC, Ericsson, Spreadtrum, OPPO, (6)   + Option 2: LGE, vivo, Lenovo, (3)   + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC, (6)   + Option 4:   + Option 5:     - Feedback aging criteria is used: Intel, (1)     - Not support this case: Samsung, Apple, Nokia, xiaomi, (4)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + none of the resource sets is used: ZTE, (1)   Q7-3: When UE-B receives both preferred resource set and non-preferred resource set from the same UE-A, what is UE-B’s behavior?   * Option 1: UE-B uses the latest received one between 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. * Option 2: UE-B determines one of the received preferred resource set and non-preferred resource set from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the 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. * Option 4: UE-B does not expect to receive both preferred resource set and non-preferred resource set from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A. * Option 5: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: Samsung, OPPO, (2)   + Option 2: vivo, Lenovo, (2)   + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Ericsson, xiaomi, (9)   + Option 4: Qualcomm, Apple, Fraunhofer, CMCC, Spreadtrum, xiaomi, CATT, (7)   + Option 5:     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + Option 3 + none of the resource sets is used: ZTE, (1) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: Samsung, OPPO, (2)   + Option 2: vivo, Lenovo, (2)   + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Fraunhofer, Ericsson, xiaomi, (10)   + Option 4: Qualcomm, Apple, CMCC, Spreadtrum, xiaomi, CATT, (6)   + Option 5:     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + Option 3 + none of the resource sets is used: ZTE, (1) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: OPPO, (1)   + Option 2: vivo, Lenovo, (2)   + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Fraunhofer, Ericsson, (9)   + Option 4: Qualcomm, CMCC, Spreadtrum, CATT, (4)   + Option 5:     - Not support this case: Samsung, Apple, xiaomi, (3)     - Up to UE-B’s implementation: Fujitsu, Huawei, (2)     - Option 2 + Option 3 + none of the resource sets is used: ZTE, (1) |

Q24-1: Based on FL’s observation above, companies provide which options is supported 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.
* Option 3: UE-B does not expect to receive more than one preferred resource sets from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A.

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| Company | Option(s) | Comments |
| NTT DOCOMO | Option 1 |  |
| Apple | Option 3 |  |
| Panasonic | Option 1 | When UE-A transmits multiple preferred resource set in a different time, the preferred resources are updated in UE-A. |

Q24-2: Based on FL’s observation above, companies provide which options is supported for UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the same UE-A.

* Option 1: UE-B uses the latest received non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.
* Option 3: UE-B determines a final non-preferred resource set by combining 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.

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| Company | Option(s) | Comments |
| NTT DOCOMO | Option 3 |  |
| Apple | Option 3 | Due to MAC CE payload size limitation, each IUC transmission may not be able to include all the non-preferred resources. Hence, the non-preferred resource sets from multiple IUC transmissions need to be combined to have a complete set. |
| Panasonic | Option 3 |  |

Q24-3: Based on FL’s observation above, companies provide which options is supported 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.
* Option 4: UE-B does not expect to receive both preferred resource set and non-preferred resource set from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A.

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| --- | --- | --- |
| Company | Option(s) | Comments |
| NTT DOCOMO | Option 3 |  |
| Apple | Option 4 | This should not be expected at UE-B.  Alternatively, we could leave it for UE implementation. |
| Panasonic | Option 3 |  |

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| Q7-4: When UE-B receives multiple preferred resource sets from the different UE-As, what is UE-B’s behavior?   * Option 1: UE-B uses each received preferred resource set for its resource selection for a TB to be transmitted to each UE-A providing the preferred resource set. * Option 2: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT, (14)   + Option 2:     - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer, (2)     - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, Apple, NEC, Ericsson, CMCC, (5)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo, (4) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT, (14)   + Option 2:     - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer, (2)     - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, Apple, NEC, Ericsson, (4)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo, (4) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT, (14)   + Option 2:     - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer, (2)     - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, , NEC, Ericsson, (3)     - Not support this case: Apple, (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo, (4)   Q7-5: When UE-B receives multiple non-preferred resource sets from the different UE-As, what is UE-B’s behavior?   * Option 1: UE-B determines a final non-preferred resource set by combining 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. * Option 2: UE-B uses each received non-preferred resource set for its resource selection for a TB to be transmitted to each UE-A providing the non-preferred resource set. * Option 3: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: Futurewei, Samsung, Qualcomm, Apple, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia, (13)   + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT, (7)   + Option 3:     - Option 1+MCR: InterDigital(for groupcast), (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei, (4) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: Futurewei, Samsung, Qualcomm, Apple, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia, (13)   + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT, (7)   + Option 3:     - Option 1+MCR: InterDigital(for groupcast), (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei, (4) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: Futurewei, Samsung, Qualcomm, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia, (12)   + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT, (7)   + Option 3:     - Option 1+MCR: InterDigital(for groupcast), (1)     - Not support this case: Apple, (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei, (4)   Q7-6: When UE-B receives both preferred resource set and non-preferred resource set from the different UE-As, what is UE-B’s behavior?   * Option 1: UE-B uses the received preferred resource set 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. * 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. * Option 3: Others (please specify it)   **FL’s observation of 1st email discussion:**   * UE-B receives inter-UE coordination information triggered by UE-B’s request:   + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT, (6)   + Option 2: Futurewei, Panasonic, DCM, (3)   + Option 3:     - UE-B uses both the received preferred resource set and non-preferred resource set from target RX UEs for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo, (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 any UE: Samsung, NEC, Ericsson, (3)     - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast), (1)     - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm, (1)     - Not support this case: Apple, (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, (3)     - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO, (1) * UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:   + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT, (6)   + Option 2: Futurewei, Panasonic, DCM, (3)   + Option 3:     - UE-B determines a final preferred resource set by combining both the received preferred resource set and non-preferred resource set from the target RX UEs. UE-B uses the final preferred resource set and final non-preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo, (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 any UE: Samsung, NEC, Ericsson, (3)     - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast), (1)     - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm, (1)     - Not support this case: Apple, (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, (3)     - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO, (1) * UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception   + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT, (6)   + Option 2: Futurewei, Panasonic, DCM, (3)   + Option 3:     - UE-B determines a final preferred resource set by combining both the received preferred resource set and non-preferred resource set from the target RX UEs. UE-B uses the final preferred resource set and final non-preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo, (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 any UE: Samsung, NEC, Ericsson, (3)     - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast), (1)     - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm, (1)     - Not support this case: Apple, (1)     - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, (3)     - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO, (1) |

Q25-1: Based on FL’s observation above, do you agree following draft proposal for UE-B’s behavior when UE-B receives multiple preferred resource sets from the different UE-As?

Draft proposal:

For UE-B’s behavior 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 a TB to be transmitted to each UE-A providing the preferred resource set.

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | No | Option 1 is not a complete solution. Consider UE-B receives multiple preferred resource sets from different UE-As. What if UE-B is to transmit to a UE, which does not provide any IUC information?  Overall, we think “UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE” is a more general solution. |
| Panasonic | Yes |  |

Q25-2: Based on FL’s observation above, do you agree following draft proposal for UE-B’s behavior when UE-B receives multiple non-preferred resource sets from the different UE-As?

Draft proposal:

For UE-B’s behavior 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 combining 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.

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| --- | --- | --- |
| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |

Q25-3: Based on FL’s observation above, companies provide which options is supported for UE-B’s behavior when UE-B receives both a single preferred resource set and a single non-preferred resource set from the different UE-As.

* Option 1: UE-B uses the received preferred resource set 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.
* 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.
* Option 3: 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 any UE
* Option 4: UE-B uses all or a subset of the received preferred resource set and non-preferred resource set from different UE-As by its implementation for its resource selection for TB(s) to be transmitted to UE-A(s) providing the preferred resource set or non-preferred resource set

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| Company | Option(s) | Comments |
| NTT DOCOMO | Option 2 |  |
| Apple | Option 4 | We prefer to leave it to UE implementation. |
| Panasonic | Option 2 | If draft proposals in Q25-1 and Q25-2 are agreed, option 2 in Q25-3 are similar concept as draft proposals in Q25-1 and Q25-2. |

* 1. **Others**

|  |
| --- |
| According to RAN2 LS R1-2200880, RAN2 already agreed that “**Inter-UE coordination (IUC) issues (on which) RAN2 mainly relies on RAN1: Whether UE-A can be in mode1 or mode2 (interested companies are invited to raise/discuss the issue directly in RAN1)**”. FL understands that RAN1 needs to make a decision on this issue.  Q15: Do you agree the following conclusion for the type of resource allocation performed by UE-A?  Draft 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   **FL’s observation of 1st email discussion:**   * Yes: Intel, Futurewei, Samsung, InterDigital, Qualcomm, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Ericsson, OPPO, Nokia, Huawei, xiaomi, CATT, (19) * No: Fraunhofer, (1) |

Q26: Do you agree the following draft conclusion?

Draft 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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
| Apple | Yes |  |
| Panasonic | Yes |  |
| ETRI | Yes |  |

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| --- | --- |
| According to following conclusion in AI 5, FL understands that RAN1 needs to make a decision on whether/how to send reply LS of R1-2200880 to RAN2.   |  | | --- | | **Incoming LSs on Rel-17 NR\_SL\_enh**  [R1-2200880](file:///C:\Users\Docs\R1-2200880.zip)           LS to RAN1 on Inter-UE coordination RAN2, Intel  To be discussed as part of email discussion in [108-e-R17-Sidelink-02] under agenda item 8.11.1.2. If response to RAN2 is needed, use the same email thread to converge on a response. |   Q16: Do you agree to send a reply LS of R1-2200880 to RAN2? If yes, please specify which information needs to be conveyed on the reply LS.  **FL’s observation of 1st email discussion:**   * Yes: Intel, Futurewei, Samsung, Apple, ZTE, CATT, (6)   + Latency bound issue is discussed in RAN1: Intel, Futurewei,   + Agreements for which RAN2 relies on RAN1: Samsung, Apple, ZTE, CATT, * No: Qualcomm, LGE, Fujitsu, DCM, Ericsson, OPPO, Huawei, (7) |

Q27: Do you agree the following draft conclusion?

Draft conclusion:

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

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| Company | Yes or no | Comments |
| NTT DOCOMO | OK |  |
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1. **Draft proposals for Monday’s GTW (February 21st)**
   1. **Scheme 1**

**FL’s observation:**

For draft proposal 1-1, the followings are observed based on the submitted contributions.

* Granularity of slot offset
  + 1: CATT, DCM, Apple, Qualcomm (4)
  + 31: LGE (1)
  + Candidates themselves are (pre)configured: Huawei (1)
  + Determined by the bit field size for indicating slot offset and SCS (e.g., 1, 2, 4, 8, 16, 32): Samsung (1)
* Maximum value of slot offset for the first resource location indication
  + 16: Apple(for SCI format 2-C) (1)
  + 32: Qualcomm (for SCI format 2-C) (1)
  + 256: Huawei, CATT(for SCI format 2-C), DCM, Apple(for SCI format 2-C) (4)
  + 1023: ZTE (1)
  + 4092: OPPO (1)
  + 8000: CATT(for MAC CE only), LGE (2)
  + 8192: Futurewei, Samsung (2)
  + Maximum reservation periodicity configured in the pool \* 2^u: Qualcomm(for MAC CE only) (1)

**Draft proposal 1-1**:

* 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 a minimum value between 256 and the (pre)configured maximum value
    - 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

**FL’s observation:**

For draft proposal 1-2, the followings are observed based on the submitted contributions.

* Keep N<=3 (i.e., remove square brackets)
  + Supported by LGE, Ericsson (2)
    - LGE: 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, DCM, Apple (3)
* Remove N parts
  + Supported by Intel (1)
* Both N<=3 and N<=2
  + Supported by Samsung (1)

**Draft proposal 1-2**:

* For following agreement, remove square brackets with replacing 3 with 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:**

For draft proposal 1-3, the followings are observed based on the submitted contributions.

* Support: Huawei, DCM, Apple, Xiaomi, ITL, LGE, Ericsson, ZTE (8)
* Not support: Panasonic, CATT, Intel, Samsung (4)

**Draft proposal 1-3**:

* A SCI format 2-C includes all the fields present in SCI format 2-A

**FL’s observation:**

For draft conclusion 1-4, the followings are observed based on the submitted contributions

* Support: vivo, Panasonic, OPPO, DCM, Spreadtrum, CMCC, Samsung, LGE, Ericsson, Mitsubishi, ZTE (11)
* Not support: Futurewei, Fraunhofer, Intel (3)

**Draft conclusion 1-4**:

* For cast type(s) of inter-UE coordination information with preferred resource set triggered by a condition other than explicit request reception
  + Neither groupcast nor broadcast for preferred resource set is supported
  1. **Scheme 2**

**FL’s observation:**

For draft proposal 2-1, the followings are observed based on the submitted contributions.

* 1st sub-bullet of draft proposal 2-1:
  + Support: Huawei, CATT, DCM, Spreadtrum, Intel, Apple, Qualcomm, LGE, Ericsson, ZTE (10)
  + Not support: Panasonic, Samsung (2)
* 2nd sub-bullet of draft proposal 2-1:
  + Support: Huawei, CATT, Qualcomm, ZTE (3)
  + Not support: Futurewei, Samsung (2)

**Draft proposal 2-1**:

* 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

**FL’s observation:**

For draft proposal 2-2, the followings are observed based on the submitted contributions.

* Support that UE pairing for selecting UE-B considers only UEs transmitting SCI format 1-A with Second UE flag (i.e., whether UE scheduling a conflict TB can be UE-B or not) of 1: Huawei, Panasonic, OPPO, CATT, DCM, LGE (6)
* Support that UE pairing for selecting UE-B considers only UEs whose PSFCH occasions for a resource conflict indication are not yet passed: Huawei, OPPO, Fujitsu, LGE (4)

**Draft proposal 2-2**:

* Confirm the following working assumption with modification in RED:
  + 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 Second UE 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 Second UE flag is set to 1 if the higher parameter of indicationUEBScheme2 is (pre)configured to ‘Enabled’, that UE is UE-B.

1. **1st email discussion (Due date: February 22nd 09:00am UTC)**
   1. **Scheme 1**

**FL’s observation:**

On remaining details on determining the preferred resource set triggered by a condition other than explicit request reception, few companies proposed the possibility of (pre)configuring parameter(s) related to a resource selection window for determining the preferred resource set. Note that according to the guideline from RAN#94 and RAN1 chairman, RAN1 should strive for avoiding the introduction of new RRC parameter unless its absolute essentiality is sufficiently justified.

Q1-1: Do you support a mechanism of (pre)configuring parameters related to n+T\_1 and n+T\_2 in addition to that UE-A determines these values by its implementation as per agreement?

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes | We support pre-configuration of duration of resource selection window for feedback generation to simplify feedback processing and its application |
| Futurewei | Yes | We support pre-configured parameters related to n+T\_1 and n+T\_2 |
| Samsung | No | We think that it is not an essential issue. |
| InterDigital | No | No further (pre)configured parameters are necessary. UE-A implementation can determine such information based on e.g. L1 priority indicated in the SCI of previously received UE-B’s transmissions. Note the reference resource location, the slot offset and TRIV value of each resource indicated in the preferred resource set will provide UE-B the exact time information of each resource so that UE-B can determine whether or not the provided resources are within its RSW. |
| Qualcomm | No |  |
| ETRI | No | Not essential |
| Apple | No | We can rely on UE-A’s implementation to determine the resource selection window to avoid new RRC parameter. |
| LGE | No | We think that UE-A’s determination is enough, and the values of n+T\_1 and n+T\_2 determined by UE-A do not need to be indicated by inter-UE coordination information. |
| Fujitsu | No | In our view, these parameters are up to UE implementation. |
| Panasonic | No | We think UE-A’s implementation as per agreement is enough. |
| ZTE | No | This would introduce new RRC parameters without benefit justified. |
| NEC | No | It’s not essential enough to introduce them. |
| Vivo | Not sure | In our understanding, the slot n is anyway determined by implementation. We are fine to further discuss whether remaining PDB can be configured or not. |
| NTT DOCOMO | No |  |
| Fraunhofer | No | We do not see the benefit of a (pre-)configuration and would prefer to leave it up to UE implementation. |
| Ericsson | Yes |  |
| CMCC | No |  |
| Spreadtrum | No |  |
| OPPO | NO | The selection window can be determined by UE-A as already agreed, given that we do not think it is so necessary to have (pre-)configuration. |
| Nokia, NSB | No | Not essential |
| Huawei, HiSilicon | No | RAN1#107b-e already agreed this is determined by UE-A by its implementation (see below). Existing agreement works and is enough.  No need for additional discussions.  ==  **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,   + ...   + UE-A determines by its implementation values of following parameters     - n+T\_1, n+T\_2   + … |
| Lenovo/Motorola Mobility | Yes | We support the pre-configuration since it is needed for condition based |
| Xiaomi | No | Further optimization is not necessary. |
| CATT, GOHIGH | No | These parameters can be up to UE-A implementation. |

**FL’s observation of 1st email discussion:**

Yes: Intel, Futurewei, Ericsson, Lenovo, (4)

No: Samsung, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, CMCC, Spreadtrum, OPPO, Nokia, Huawei, Xiaomi, CATT, (20)

Q1-2: If the answer of Q1-1 is yes, please specify details of (pre)configuring parameters related to n+T\_1 and n+T\_2.

|  |  |
| --- | --- |
| Company | Comments |
| Intel | We support pre-configuration of duration of resource selection window for feedback generation to simplify feedback processing and its application |
| Futurewei | T\_1, T\_2 can be preconfigured values, where n is the reference slot when UE-A starts to process the sensing results and generate coordination information. |
| Ericsson | The pre-configured resource selection window should cover a minimum number of slots such that UE-B can perform an accurate assessment of the pool situation. Therefore, T\_2 – T\_1 > X number of slots. |

**FL’s observation of 1st email discussion:**

T\_2-T\_1 is (pre)configured: Intel, Ericsson,

T\_1, T\_2 are (pre)configured: Futurewei,

**FL’s observation:**

Few companies proposed to additionally indicate the lowest subchannel index for the first resource location(s) of TRIV(s) to increase the number of resources indicated by inter-UE coordination information at the expense of payload size increase.

Q2: Which option is preferred in terms of indicating frequency resource in the first resource location of each TRIV?

* Option 1: Lowest subchannel index for the first resource location of each TRIV is separately indicated by inter-UE coordination information
* Option 2: Resources in the first resource location of each TRIV are not used for indicating the set of resources in inter-UE coordination information (i.e., no support of indicating lowest subchannel index for the first resource location of each TRIV)

|  |  |  |
| --- | --- | --- |
| Company | Option | Comments |
| Intel | Option 1 | It requires less number of bits for feedback indication with the same number of resources |
| Futurewei | 2 with comments | Additional indication may lead to a large size of each TRIV/FRIV. If size is not an issue for N=3 in 2nd SCI, we are also ok for option 1. |
| Samsung | Option 2 |  |
| InterDigital | Option 2 | When the maximum number of resource combinations *N* is assumed to be 2 to fit the SCI-2 size, the first resource sub-channel information is not necessary because FRIV alone provides the required 2 sub-channel allocations. |
| Qualcomm |  | Either option 1 or option 2 is acceptable |
| ETRI | Option 1 |  |
| Apple | Option 1 | To support to indicate up to 3 resources in a combination of (TRIV, FRIV, periodicity), we think it is necessary to indicate the lowest subchannel index of the first resource location.  In case of Option 2, we can only indicate 2 resources in a combination of (TRIV, FRIV, periodicity), which largely reduces the indication capability. For example, if UE-A detects a resource reservation from another UE of 3 resources, UE-A has to use 2 combinations of (TRIV, FRIV, periodicity) to indicate it. |
| LGE | Option 2 | In this stage, further optimization needs to be deprioritized unless the system is broken. |
| Fujitsu | Comments | Option 1 is suitable when the coordination information is conveyed by MAC CE only. Option 2 is suitable when the coordination information is conveyed by both SCI format 2C and MAC CE. If pursuing a unified solution, Option 2 is slightly preferred. |
| Panasonic | Option 1 | We agree Intel’s view. Option 2 is also acceptable for us. |
| ZTE | Option 1 |  |
| NEC | Option 1/2 | Fine with both |
| vivo | Option 1 | Option 1 is straightforward and cost less signaling overhead to indicate a same number of resource. |
| NTT DOCOMO | Option 2 | Further increase of SCI 2-C payload size is not preferable. |
| Fraunhofer | Option 1 | Since we have agreed to use TRIV, we should utilize its benefits to the fullest, which includes using the resources indicated in the first resource location of the TRIV. |
| Ericsson | Option 1 |  |
| Spreadtrum | Option 1 |  |
| OPPO | Option 1 | As sl-MaxNumPerReserve=3 is assumed, one TRIV consists of 9 bits, if following Option 2, each TRIV indicates 2 resources, for this actually only 5 bits are needed, that is in Option 2 each TRIV leads to 4 bits waste. If N<=2, there is room to accommodate 2 lowest subchannel indexes. |
| Nokia, NSB |  | Either Option is fine |
| Huawei, HiSilicon | see comments | We suggest proponents of Option 1 can give more clear proposals, e.g., how many bits are additionally needed, what’s the detailed design, etc.  In general, RAN1 needs to discuss other issues first, e.g., Q3-1, Q11-2, etc., so that RAN1 can know how many bits are needed by SCI 2C, and whether there is room for Option 1. |
| Xiaomi | Option 1 | We think option 1 is more efficient than option2. |
| CATT, GOHIGH | Option 1 | Option 1 is straight forward and efficient than option 2 if the total payload size SCI-2C is not exceed 140bits. |

**FL’s observation of 1st email discussion:**

Option 1: Intel, Qualcomm, ETRI, Apple, Panasonic, ZTE, NEC, vivo, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Xiaomi, CATT,

Option 2: Futurewei, Samsung, InterDigital, Qualcomm, LGE, Fujitsu, NEC, DCM, Nokia, Huawei,

**FL’s observation:**

It would be necessary that RAN1 decides the exact bit field size of each content in inter-UE coordination information and its request.

Q3-1: Do you agree following bit field size of a SCI format 2-C for each content of inter-UE coordination information? If you have different view on the payload size, please specify the value with target row. Note that the maximum number of resource combinations is assumed to be 2 and the maximum slot offset value for first resource location indication is assumed to be 255 in order to align with the draft proposals in section 1.1. The “Note” in the following table is just informative part (i.e., will not be included in the part of agreement).

|  |  |  |  |
| --- | --- | --- | --- |
| Row | Field name | Field size (in bits) | Note: Maximum number of bits |
| 0 | Providing/requesting indicator | 1 | 1 |
| 1 | Resource combination(s) | Where is provided by the higher layer parameter sl-NumSubchannel, is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. | 2\*(13+9+4) |
| 2 | First resource location(s) |  | 2\*8 |
| 4 | Reference slot location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. | 10+7 |
| 5 | Resource set type | 1 | 1 |

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | comments | We are generally ok with the bit field size, but just want to clarify, if N<=2 is adopted in 2nd SCI, then the maximum slot offset can be larger than 256. Since 256 is in red, the row 2, ‘8’ should also be in red. |
| Samsung | No | We suggest the followings:  Resource combination(s): ~~2~~ 3\*(13+9+4)  First resource location(s): 2\*8 [First TRIV’s location is the same as the reference slot location  Reference slot location: Simplify as: |
| InterDigtal | Yes |  |
| Qualcomm |  | We agree with the fields included in the SCI format 2-C but require time to confirm the size of each field. The number 2 should be in brackets until we confirm the value of N. |
| ETRI | Yes with comment | Add 2\*5 bits for lowest subchannel index(s) |
| Apple | Comments | We have the following comments:  1. We still need to indicate the lowest sub-channel index of the first resource location of each TRIV in the table, which is (N\*5) bits.  2. For resource set type, the field size could be 0 or 1 bit depending on resource pool (pre)configuration. If resource pool (pre)configures that resource set type is indicated by UE-B’s explicit request and IUC triggered by a condition other than explicit request is not supported, then this field is 0 bit.  3. For the “reference slot location” field, we agree with Samsung that simply use 14+ to indicate the field size.  4. Note that although a maximum of 2 (or 3) combinations of (TRIV, FRIV, periodicity) is allowed to be contained in SCI format 2-C, it is possible that a SCI format 2-C only contains 1 or 2 combinations. Hence, we need to have a scheme to indicate the actual number of combinations carried in SCI format 2-C. It is possible to have an extra bit field in SCI format 2-C for this indication. |
| LGE | Yes | It seems straightforward if the red parts are agreed.  Regarding the actual number of resource combinations, the existing rule (TRIV field can indicate 1 or 2 or 3 resources) can be reused without any additional bit field. |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| vivo | comments | Similar as Samsung’s comment, first TRIV’s first resource location is the same as the reference slot location. 1\*8 bits is used for first resource location indication. |
| NTT DOCOMO | Yes | Considering the current situation, it would be better to set 2 and 255 with brackets. |
| Fraunhofer | Yes |  |
| Ericsson | See comment | We are supportive of this agreement updating the relevant values to reflect the latest agreements. |
| Spreadtrum | Yes |  |
| OPPO | Comments | Agree that N=2, the number of bits may exceed 140 if N=3 .  The field of “Resource combiniation(s)” should include 2\*5 bits for lowest subchannel indexes in addition, includes up to 2\*(13+9+4+5) bits.  Agree with Samsung that the offset for first TRIV is not needed, if N=2, “First resource location(s)” field only needs 8 bits. |
| Nokia, NSB | Yes, with comment | * The number of combinations (e.g., [2]) should be in brackets. * If agreed (see previous question Q2), add for indicating the lowest subchannel index of the first resource location of each TRIV. |
| Huawei, HiSilicon | Yes | At this stage, we prefer a simple solution and suggest to avoid over-engineering.  With the assumption that N=2, the table above is straightforward and fine to us.  “Resource set type” field should be always present in inter-UE coordination information to avoid increasing UE-B’s SCI decoding complexity.  For example, let’s assume the resource pool enables both request-based Scheme 1 and condition-based Scheme 1. If “resource set type” field does not exist in IUC information when UE-A transmits IUC based on reception of request from UE-B, then there will be two kinds of SCI format 2C for IUC in the resource pool, i.e.   * When UE-A transmits IUC based on condition, the “resource set type” field exists in SCI format 2C (let’s call it SCI format 2C-1) * When UE-A transmits IUC based on reception of request from UE-B, the “resource set type” field does not exist in SCI format 2C (let’s call it SCI format 2C-2)   It’s possible that one UE-B can have multiple unicast links with multiple UE-As. E.g., UE-B may send request to UE-A1 and expects IUC from UE-A1, and simultaneously UE-A2 may also send IUC to UE-B based on conditions.  In the above case, after UE-B sends request to UE-A1, in order to decode IUC from both UE-A1 and UE-A2, UE-B needs to decode two kinds of SCI format 2C (SCI 2C-1 and 2C-2) at every candidate resource, which increases UE-B’s SCI decoding complexity since the sizes of SCI 2C-1 and 2C-2 are different.  To avoid increasing UE-B’s SCI decoding complexity as above, we propose that “resource set type” field is always present in SCI format 2C for IUC. Considering “resource set type” field is just 1 bit, including this field should be very simple. |
| Lenovo/Motorola Mobility | Yes |  |
| xiaomi | Yes |  |
| CATT, GOHIGH | Comment | Adding 2\*5bits for indicating frequency location of first resource of each TRIV as proposed in Q2. The other fields are fine. |

**FL’s observation of 1st email discussion:**

* Yes: Futurewei, InterDigital, Qualcomm, ETRI, LGE, Fujitsu, Panasonic, ZTE, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, Lenovo, Xiaomi, CATT,
  + Put bit field sizes related to the number of combinations with square bracket: Futurewei, Qualcomm, Ericsson, Nokia,
  + Add bit field size for the lowest subchannel index for first resource location if agreed: ETRI, OPPO, Nokia, CATT,
* No: Samsung, Apple, vivo,
  + Remove first resource location for first TRIV: Samsung, vivo,
  + Resource set type size depending on a combination of (pre)configurations: Apple,

Q3-2: Do you agree following bit field size of a SCI format 2-C for each contents of an explicit request for inter-UE coordination information? If you have different understanding on the payload size, please specify the value with target row. The “Note” in the following table is just informative part (i.e., will not be included in the part of agreement).

|  |  |  |  |
| --- | --- | --- | --- |
| Row | Field name | Field size (in bits) | Note: Maximum number of bits |
| 0 | Providing/requesting indicator | 1 | 1 |
| 1 | Priority | 3 | 3 |
| 2 | Number of subchannels | Where is provided by the higher layer parameter sl-NumSubchannel | 5 |
| 3 | Resource reservation period | Where is the number of entries in the higher layer parameter sl-ResourceReservePeriodList. | 4 |
| 4 | Resource selection window location | Where is 0, 1, 2, 3 for SCS of 15kHz, 30kHz, 60kHz, 120kHz, respectively. | 2\*(10+7) |
| 5 | Resource set type | 1 bit if determineResourceSetTypeScheme1 is set to ‘UE-B’s request’, otherwise, 0 bit |  |

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | Yes | We are ok with the analysis based on existing agreements. |
| Samsung | No | We suggest the followings:  At first, we can include zone ID  For resource section window size,  Start of window is: bits  End of window is: 10 bits.  The ending time is relative to the starting time of the resource selection window and is in units of 0.5ms with a size of 10 bits |
| InterDigital | Yes |  |
| Qualcomm |  | We agree in principle but need additional time to verify the details. The number 2 should be in brackets until we confirm the value of N. |
| ETRI | Yes |  |
| Apple |  | We think the IUC latency bound is also contained in SCI format 2-C. This information is used to indicate when the IUC should be transmitted.  For the “Resource selection window location” field, we agree with Samsung that simply use 2\*(14+) to indicate the field size for simplicity. |
| LGE | Yes | Considering that some padding bits will be added to payload of the request, saving bit field of resource set type field based on (pre)configuration would not have benefit, but for progress, we can accept it.  According to the agreement made in 1st GTW session, zone ID is already excluded in a SCI format 2-C. We do not need to discuss it.  Regarding the end of window, there is an explicit agreement that the end of a resource selection window is provided by DFN index and slot index. |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| vivo | comments | Similar as Samsung’s comment,The ending time is relative to the starting time of the resource selection window |
| NTT DOCOMO | Yes | This seems to be straightforward based on the existing agreement. To QC, the “2” of 4th row is not related N value but a value to indicate both starting time and ending time. |
| Fraunhofer | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes, with addition | When the request is sent using SCI 2-C, that SCI 2-C has to be padded with zeros until its payload size is equal to the payload size of the IUC information message. Instead of using padding, these bits can be exploited to convey IUC information to UE-A to increase IUC reception reliability as well as UE-B power saving. |
| Huawei, HiSilicon | Yes | At this stage, we prefer a simple solution and suggest to avoid over-engineering.  The table above is straightforward and fine to us. No need to include other new fields. |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Futurewei, InterDigital, Qualcomm, ETRI, LGE, Fujitsu, Panasonic, ZTE, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT,
* No: Samsung, Apple, vivo,
  + Include zone ID: Samsung,
  + Ending time is relative to the starting time: Samsung, vivo,
  + Latency bound: Apple,

**FL’s observation:**

For MAC CE design in RAN2, it would be necessary that RAN1 informs to RAN2 the range/value of the payload size of each content in inter-UE coordination information and its request. Also according to RAN2 LS R1-2200880, RAN2 already 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**”. FL understands that RAN1 needs to make a conclusion on the information and its length for IUC MAC CE.

Q4-1: When both SCI format 2-C and MAC CE are used as the container of inter-UE coordination information, do you agree that the same bit field size of each content of inter-UE coordination information in a SCI format 2-C is applied to MAC CE?

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | No | SCI format 2-C may indicate subset of feedback resources and SCI-Format 2C content can be re-evaluated. FRIV open issue needs to be resolved first. We assume FRIV indication for each triplet Starting subchannel of the first resource in the triplet |
| Futurewei | Yes | We prefer the same. |
| Samsung | Yes |  |
| InterDigital | Yes |  |
| Qualcomm | No | SCI-2 and MAC CE convey the same information but given the signaling size constraint in SCI-2 does not apply to MAC CE, there is no reason to keep the same bit field size for both SCI-2 and MAC-CE. This will also avoid having two sizes for the MAC-CE, one when SCI format 2-C is used and one when it is not. |
| ETRI | Yes |  |
| Apple | Yes |  |
| LGE | Yes | To indicate the same set of resources as per agreement, it seems the simplest way.   * *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]* |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| vivo | Yes | If not the same, MAC CE only can be used. |
| NTT DOCOMO |  | We are fine with the proposal.  Alternatively, larger N value can be used for MAC-CE. In other words, SCI includes N1 sets and MAC-CE contains N2 sets. N2 >= N1, and N1 sets are subset of N2 sets. |
| Fraunhofer | Yes | We support this in order to reduce specification efforts |
| Ericsson | Yes | The content in the SCI format 2-C and the content in the MAC CE has to be the same. |
| CMCC | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | No | We share QC’s view.  The “first resource location of each TRIV” field may have larger values (up to 8000) when only MAC CE is used. This means that decoding the MAC CE does not depend on whether SCI format 2-C is used. |
| Huawei, HiSilicon | Yes | As per previous agreement (copied below, cyan part), the same resource set is indicated in the 2nd SCI and the MAC CE. So the answer should be “Yes”.  ==  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] |
| Lenovo/Motorola Mobility | yes |  |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Futurewei, Samsung, InterDigital, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Huawei, xiaomi, CATT,
* No: Intel, Qualcomm, Nokia,
  + SCI format 2-C may indicate subset of feedback resources and SCI-Format 2C content can be re-evaluated: Intel,
  + Signaling size can be different: Qualcomm, Nokia,

Q4-2: When both SCI format 2-C and MAC CE are used as the container of an explicit request for inter-UE coordination information, do you agree that the same bit field size of each content of the request in a SCI format 2-C is applied to MAC CE?

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Comment | Can accept it for the progress. Note that reference slot signaling mechanism may be different for SCI format 2C and MAC CE |
| Futurewei | Comments | We are generally ok with the same bit field size if no additional information is included in the request. We are fine that MAC CE is allowed for sending additional request information if agreed later. |
| Samsung | Yes |  |
| InterDigital | Yes |  |
| Qualcomm | Yes |  |
| ETRI | Yes |  |
| Apple | Yes |  |
| LGE | Yes | We can consider the same principle of case of inter-UE coordination information. |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| Vivo | Yes |  |
| NTT DOCOMO | Yes |  |
| Fraunhofer | Yes | We support this in order to reduce specification efforts |
| Ericsson | Yes | The content in the SCI format 2-C and the content in the MAC CE has to be the same. |
| CMCC | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | Yes | “same bit field size” works and is simple. |
| Lenovo/Motorola Mobility | No | MAC CE maybe used to send additional information, if agreed later |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Intel, Futurewei, Samsung, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT,
* No: Lenovo,
  + MAC CE maybe used to send additional information: Lenovo,

Q4-3: When MAC CE only is used as a container of inter-UE coordination information, please specify how to determine the number of combinations N in inter-UE coordination information in MAC CE (e.g., whether the bit field size of “resource combination(s)” or “first resource location(s)” is changed depending on the actual number of resource combinations to be conveyed by MAC CE, whether the maximum value of N is bounded by the size of a TB including the MAC CE to be transmitted).

|  |  |
| --- | --- |
| Company | Comments |
| Intel | Our preference is to support transmission of full feedback information up to maximum MAC CE size |
| Futurewei | We may need to indicate N value with a specified Nmax to define the bit size. |
| Samsung | RAN1 should provide the maximum value of N. Then, we think that the same bit field size of each content of the coordination message in a SCI format 2-C can be applied. |
| InterDigital | The bit field size of “resource combination(s)” will change as slot offset can be up to 8000 as pre-configured based on SCS. The total size of such MAC CE (and therefore Nmax) can depend on the TB size multiplexed with the MAC CE and also the priority of the data as higher layer may run LCP procedure. |
| Qualcomm | The number N is signaled as a separate field in the MAC CE. We propose the N field to be 7 bit long indicating up to 128 TRIVs. |
| ETRI | Agree with Futurewei |
| Apple | The actual number of combinations N in MAC CE is additionally indicated by MAC CE and maximum number of N should be defined. |
| LGE | In our understanding, the upper limit of the number of combination to be conveyed on a MAC CE depends on (maximum supported) TB size.  We think that total payload size of the MAC CE need to be changed depending on the number of combinations N to be conveyed on the MAC CE. Otherwise, the size of MAC CE could be excessively large.  It is up to RAN2 decision whether the number of combinations N is separately indicated by inter-UE coordination information or subheader or a bit field is used to indicate whether the next combination is present or not. |
| Fujitsu | At least the maximum value of N should be specified. In other words, not all the preferred/non-preferred resources have to be reported. |
| ZTE | We prefer to indicated N in the MAC CE, and the value of N is selected to ensure that the size of a TB including the MAC CE or the maximum MAC CE size is not exceeded. |
| Vivo | The maximum number of N can be defined/configured |
| NTT DOCOMO | Actual N value can be informed at MAC layer. Details should be up to RAN2. |
| Fraunhofer | We agree with other companies to (pre-)configure the maximum value of N. |
| Ericsson | In our view, this aspect should be left up to RAN2. |
| CMCC | Let RAN2 decide. |
| Spreadtrum | N should be indicated directly, and the bit field size of “resource combination(s)” or “first resource location(s)” can be derived by the given N. Besides, the maximum value of N should also be provided. |
| OPPO | Bit field size of each contents should be the same as SCI format 2-C, and agree with others that maximum value of N is needed for RAN2 to define the MAC CE. As whether IUC is transmitted or not is up to UE-A implementation, other restriction on the value of N is not necessary. |
| Nokia, NSB | Agree with QC to explicitly indicate the number N in the MAC CE. A restriction on the maximum number N is needed. |
| Huawei, HiSilicon | MAC-CE can directly reuse the design in SCI 2C, the only difference is the number of combinations N, which depends on the length of MAC CE indicated by MAC header and can be decided in RAN2.  Discussion on length of inter UE coordination information for a SL MAC CE should be taken place in RAN2, given that RAN1 is not aware of the size limitation of a SL MAC CE.  In general, RAN1 is not the place to discuss detailed designs of SL MAC-CE, we suggest to let RAN2 discuss and decide them. |
| Lenovo/Motorola Mobility | N can be preconfigured, indicated as part of the request message |
| xiaomi | We share the similar view with intel. |
| CATT, GOHIGH | The N value is indicated in MAC-CE, and we are fine with introducing a maximum N value |

**FL’s observation of 1st email discussion:**

* Bit field sizes related to the number of resource combinations:
  + Varying depending on the number of resource combinations to be conveyed in inter-UE coordination information
    - Supported by Futurewei, Qualcomm, ETRI, Apple, LGE, ZTE, DCM, Spreadtrum, Nokia, Huawei, CATT,
      * Indicating the number of resource combinations separately in inter-UE coordination information: Futurewei, Qualcomm, ETRI, Apple, ZTE, Spreadtrum, Nokia, CATT,
      * It is up to RAN2 decision how to express how many resource combinations are conveyed by inter-UE coordination information: LGE, DCM, Huawei,
      * (pre)configured: Lenovo,
  + Varying depending on TB size multiplexed with the MAC CE and priority of the data
    - Supported by InterDigital,
  + Up to RAN2
    - Supported by Ericsson, CMCC,
* Maximum number of resource combinations:
  + Derived based on maximum MAC CE size: Intel, ZTE, xiaomi,
  + Derived based on maximum TB size: LGE, ZTE
  + 128: Qualcomm,
  + (pre)configured value: vivo, Fraunhofer,
  + No need to specify it: OPPO,

Q4-4: When MAC CE only is used as a container of an explicit request for inter-UE coordination information, do you agree that the same bit field size of each content of the request in a SCI format 2-C is applied to MAC CE?

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | Comments | We are generally ok with the same bit field size if no additional information is included in the request. We are fine that MAC CE is allowed for sending additional request information if agreed later. |
| Samsung |  | We think that the same bit field size of each content of the request in a SCI format 2-C can be applied. |
| InterDigital | No | When MAC CE only is used, the slot offset value is the pre-configured value which can be 8000 (120kHz SCS) and SCI-2C is limited to 256 |
| Qualcomm | Yes |  |
| ETRI | Yes |  |
| Apple | Yes |  |
| LGE | Yes |  |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes | If no additional information, it would be same bit field size without padding bits in SCI format 2-C for request signalling. |
| ZTE | Yes |  |
| Vivo | Yes |  |
| NTT DOCOMO | Yes |  |
| Fraunhofer | Yes | We support this in order to reduce specification efforts |
| Ericsson | Yes | The content in the SCI format 2-C and the content in the MAC CE has to be the same. |
| CMCC | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | Yes | “same bit field size” works and is simple. |
| Lenovo/Motorola Mobility | No |  |
| Xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Futurewei, Samsung, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT,
* No: InterDigital, Lenovo,
  + Slot offset value is (pre)configured value: InterDigital,

**FL’s observation:**

On the condition that a SCI format 2-C can be used as a container of inter-UE coordination information, few companies proposed additional restrictions. It was agreed in GTW session on February 21st that a SCI format 2-C includes all the fields present in SCI format 2-A except for cast type indicator.

Q5: Which option is preferred for the additional condition that a SCI format 2-C can be used as a container of inter-UE coordination information?

* Option 1: No further restriction is introduced
* Option 2: A SCI format 2-C can convey only preferred resource set
* Option 3: A SCI format 2-C can be used only if inter-UE coordination information is not multiplexed with other data
* Option 4: A SCI format 2-C can be used only when cast type of inter-UE coordination information transmission is unicast regardless of whether it is multiplexed with other data or not
* Option 5: Others (please specify it)

|  |  |  |
| --- | --- | --- |
| Company | Option(s) | Comments |
| Intel | Option 2 |  |
| Futurewei | 1 | We prefer option 1 unless there is some critical issue that SCI 2-C does not work based on current agreements |
| Samsung | Comment | 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.* |
| InterDigital | Option 1 |  |
| Qualcomm | Option 3 | SCI format 2-C reception is a capability and UE not supporting this will not be able to decode the corresponding data.  We would like to propose Option 2 in combination with Option 3.  Our understanding that by not including a cast type indicator field in the GTW agreement, only unicast is supported. |
| ETRI | Option 1 |  |
| Apple | Option 1 |  |
| LGE | Option 4 with condition | If UE capability related to a SCI format 2-C RX is exchanged between UE-A and UE-B via PC5-RRC, we can accept Option 4.  As per agreement, there is no case where only a SCI format 2-C is used as a container of inter-UE coordination information. We do not need to discuss this possibility at all. |
| Fujitsu | Option 1 |  |
| Panasonic | Option 1 |  |
| ZTE | Option 4 |  |
| Vivo | Option 4 | Option 4 has been agreed, since we agree that unicast is supported for request-based coordination signaling transmission, and no cast type indicator in format 2-C. |
| NTT DOCOMO | Comment | We are not sure actual intention of Option 1. Now we have agreement as cast type indicator is not included. In this case, without agreeing Option 4, how can we use 2-C in groupcast/broadcast? |
| Fraunhofer | Option 1 | We do not see the need for any further restrictions. |
| Ericsson | Option 1 |  |
| CMCC | Option 4 | We shared similar views as QC that as cast type indicator is excluded from SCI format 2-C, only unicast is supported. In this sense, we prefer Option 4, as both Option 2 and Option 3 puts more restrictions on using SCI format 2-C。 |
| Spreadtrum | Option 1 |  |
| OPPO | Option 4 only | Option 4 has already been implied by the lasted agreement. |
| Nokia, NSB | Option 1 | It can be left to UE-A implementation to determine whether UE-B is able to receive SCI format 2-C (e.g. UE-A may have learned about other UEs’ capabilities in previous unicast associations). |
| Huawei, HiSilicon | Option 1 | Existing agreements are enough. We do not see any benefits for such discussions. No need for additional conditions. |
| Lenovo/Motorola Mobility | Option 1 |  |
| Xiaomi | Option 1 | There is no need to define additional condition. |
| CATT, GOHIGH | Option 4 |  |

**FL’s observation of 1st email discussion:**

* Option 1: Futurewei, InterDigital, ETRI, Apple, Fujitsu, Panasonic, Fraunhofer, Ericsson, Spreadtrum, Nokia, Huawei, Lenovo, xiaomi,
* Option 2: Intel,
* Option 3: Qualcomm,
* Option 4: LGE, ZTE, vivo, DCM, CMCC, OPPO, CATT,
* Option 5:
  + Support a SCI format 2-C only case: Samsung,

**FL’s observation:**

A number of companies proposed to introduce latency bound for the inter-UE coordination information (which has an impact on, e.g., resource selection window location/size for selecting TX resources of inter-UE coordination information). Meanwhile, according to RAN2 LS R1-2200880, RAN2 already agreed that “**IUC issues (on which) RAN2 starts discussion: Timer to handle latency bound for inter-UE coordination**”. FL understands that RAN1 does not need to have duplicated discussion for this issue.

Q6: If companies have different understanding on the above FL’s understanding for the issue of introducing latency bound for the inter-UE coordination information, please specify it.

|  |  |
| --- | --- |
| Company | Comments |
| Intel | It should be in RAN1 scope as it is relevant to resource allocation and resource selection procedure |
| Futurewei | We also prefer to introduce latency bound (or a deadline) for the inter-UE coordination information, i.e., a timing offset Tr before n+T1, where Tr>Tproc,1 due to the transmission time from UE-A to UE-B plus processing time for UE-B resource selection. We suggest the following proposal.  For UE-B’s transmissions of both periodic traffic and aperiodic traffic   * Specify a deadline for UE-A transmission of coordination via a timing offset Tr, i.e., UE-A sending coordination information by n+T1-Tr with Tr< 31 logical slots and Tr> Tproc,1 * UE-A sensing for coordination information ends by n+T1 – Tr – Tproc,0 . * Sensing for aperiodic traffic is performed within 31 logical slots earlier than n+T1. |
| Samsung | We agree with FL’s understanding. |
| Qualcomm | We agree in principle but may be good to discuss in RAN 1 if RAN 2 is unable to make sufficient progress. |
| Apple | Since this latency bound for IUC may be contained in SCI format 2-C and it is related to resource selection window or PDB determination, we prefer to discuss or introduce it in RAN1. |
| Panasonic | We agree with FL’s understanding. |
| NEC | Agree |
| vivo | This is RAN1 issue, better to be discussed in RAN1.  Besides the timer, RAN1 needs to discuss how to define the association relationship between request and coordination signaling, e.g., one-to-one association between request and coordination signaling similar as CSI request and CSI feedback. It should be clarified that a new request transmission should be located after the latency bound. |
| NTT DOCOMO | We are fine not to discuss at RAN1. |
| Ericsson | Same view as FL |
| Spreadtrum | We are OK to discuss in RAN1. |
| OPPO | Agree with FL |
| Huawei, HiSilicon | Agree with FL’s understanding.  In addition, 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. So RAN1 does not need to have duplicated discussions here. |
| Lenovo/Motorola Mobility | Let RAN2 handle it |
| xiaomi | We support to define the latency bound, and we think RAN 1 can still discuss this issue and make agreement on it. |
| CATT, GOHIGH | We prefer to discuss it in RAN1, since this is related to resource selection procedure. |

**FL’s observation of 1st email discussion:**

* Discuss latency bound in RAN1: Intel, Futurewei, Qualcomm, Apple, vivo, xiaomi, CATT,
* Discuss latency bound in RAN2 as per LS from RAN2: Samsung, Panasonic, NEC, DCM, Ericsson, OPPO, Huawei, Lenovo,

**FL’s observation:**

Few companies proposed how to handle the case when UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As.

Q7-1: When UE-B receives multiple preferred resource sets from the same UE-A, what is UE-B’s behavior?

* 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.
* Option 2: UE-B determines one of the received preferred resource sets from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the UE-A.
* Option 3: UE-B does not expect to receive more than one preferred resource sets from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A.
* Option 4: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | Feedback aging criteria needs to be defined. Latest received feedback does not mean that it is not outdated at a given moment.  Two (or more) feedbacks may have different non-overlapping resource selection windows for feedback generation.  More detailed filtering conditions need to be defined |
| Futurewei | 3 | 1 | 1 | For IUC triggered by UE-B’s request, UE-B does not expect multiple sets. For other cases with condition based IUC, UE-B uses latest one when performing resource selection. |
| Samsung | Option 1 | Option 1 | No supported | Latest IUC is used. |
| InterDigital | Option 1 | Option 1 | Option 1 | Certain resources can become non-preferred over time due to UE-A’s mobility and/or transmission, it is therefore beneficial to apply the latest information. |
| Qualcomm | Option 1 | Option 1 | Option 1 |  |
| Apple | Option 3 | Option 2 | No need to specify |  |
| LGE | Option 2 or 3 | Option 2 | Option 2 | For the request-based IUC, depending on the discussion or conclusion on the latency bound, option 2 or 3 is supported. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 1 | Option 1 | Option 1 |  |
| ZTE |  |  |  | UE-B may determine itself whether a received IUC information is used or not based on multiple factors(the received time point, whether it is requested based, .etc), it is not necessary and very difficult to define such behavior in the spec, as we can see in below questions, a lot of consequent discussion would be introduced. We prefer to leave it up to UE implementation, and for option 2, it may be a case that UE-B may use non of the received preferred resource sets. |
| NEC | Option 3 | Option 1 | Option 1 |  |
| vivo | Option 2 | Option 2 | Option 2 | All the options can work, option 2 incur less spec. impact, which is preferred. |
| NTT DOCOMO | Option 1 | Option 1 | Option 4 | Preferred resources corresponding to explicit request should be used preferentially since preferred resources based on condition might not be suitable for UE-B’s transmission (e.g. priority value). |
| Fraunhofer | Option 4 | Option 4 | Option 4 | If UE-B receives multiple preferred resource sets, it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A.  We also prefer a common solution across scenarios. |
| Ericsson | Option 1 | Option 1 | Option 1 | The latest inter-UE coordination received by UE-B is the one with the most accurate information about the preferred set of resources. |
| CMCC | Option 3 | Option 3 | Option 4 (See comments) | Regarding the case when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously, we think that a more proper behavior is to determine based only on the preferred resource set triggered by UE-B’s request, as those triggered by conditions of which the Tx parameters are (pre)-configured or determined by UE-A’s implementation may not meet the UE-B’s requirement. |
| Spreadtrum | Option 3 | Option 1 | Option 1 |  |
| OPPO | Option 1 | Option 1 | Option 1 | Latest IUC information is determined based on latest sensing results by UE-A, and it should override the previous ones. |
| Nokia, NSB | Option 1 | Option 1 | Cannot happen since same UE-A can’t transmit more than one IUC message simultaneously in the same slot. | Currently, UE-B can’t distinguish whether an IUC message received from UE-A was triggered by a request or another condition |
| Huawei, HiSilicon | Option 4 | Option 4 | Option 4 | As shown in Q7-1 ~ Q7-6, there are many cases including preferred/non-preferred resource set from single/multiple UE-As. Under each case, there are many divergent options.  It will be very time consuming to discuss all the cases and options one-by-one.  Instead, we suggest the following proposal, which relies on UE-B’s implementation to use one or multiple of the IUC information.  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility | Comment | Option 2 | Option 2 | Why UE-B transmit second explicit request when IUC for the first explicit request was yet to be received. It should be handled similar to CSI, where there is no parallel processing. |
| xiaomi | Option 3 | Option 3 | No need to specify | For simplicity, UE-B doesn’t expect this will happen in R-17. |
| CATT, GOHIGH | Option 3 | Option 1 | comment | For the third case, we think UE-B should prioritize the received preferred resource set based on explicit request where the UE-B’s transmission parameters are included. |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: Samsung, InterDigital, Qualcomm, Panasonic, DCM, Ericsson, OPPO, Nokia,
  + Option 2: LGE, vivo,
  + Option 3: Futurewei, Apple, LGE, NEC, CMCC, Spreadtrum, Lenovo, xiaomi, CATT,
  + Option 4:
    - Feedback aging criteria is used: Intel,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,
    - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: Futurewei, Samsung, InterDigital, Qualcomm, Panasonic, NEC, DCM, Ericsson, Spreadtrum, OPPO, Nokia, CATT,
  + Option 2: Apple, LGE, vivo, Leonovo,
  + Option 3: CMCC, xiaomi,
  + Option 4:
    - Feedback aging criteria is used: Intel,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,
    - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: Futurewei, InterDigital, Qualcomm, Panasonic, NEC, Ericsson, Spreadtrum, OPPO,
  + Option 2: LGE, vivo, Lenovo,
  + Option 3:
  + Option 4:
    - Feedback aging criteria is used: Intel,
    - Not support this case: Samsung, Apple, Nokia, xiaomi,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,
    - Preferred resources corresponding to explicit request should be used preferentially: DCM, CMCC, CATT,
    - it determines a final preferred resource set by combining all the received preferred resource sets from the same UE-A: Fraunhofer,

Q7-2: When UE-B receives multiple non-preferred resource sets from the same UE-A, what is UE-B’s behavior?

* Option 1: UE-B uses the latest received non-preferred resource set from the same UE-A for its resource selection for a TB to be transmitted to the UE-A.
* Option 2: UE-B determines one of the received non-preferred resource sets from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the UE-A.
* Option 3: UE-B determines a final non-preferred resource set by combining 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.
* Option 4: UE-B does not expect to receive more than one non-preferred resource sets from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A.
* Option 5: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | Feedback aging criteria needs to be defined. Latest received feedback does not mean that it is not outdated at a given moment.  Two (or more) feedbacks may have different non-overlapping resource selection windows for feedback generation.  More detailed filtering conditions need to be defined |
| Futurewei | 4 | 1 | 1 | For IUC triggered by UE-B’s request, UE-B does not expect multiple sets. For other cases with condition based IUC, UE-B uses latest one when performing resource selection. |
| Samsung | Option 1 | Option 1 | Not supported |  |
| InterDigital | Option 1 | Option 1 | Option 1 | We think it is possible UE-A updates non-preferred resource set over time and it is not guaranteed that a previously indicated non-preferred resource is still non-preferred if it is not included in a latest non-preferred resource set from the same UE-A. So, Option 3 may not apply and in general the latest non-prefer resource set, i.e., Option 1 is the most pplicable information. |
| Qualcomm | Option 3 | Option 3 | Option 3 | We understand combining non-preferred resources to mean a union of the sets of non-preferred resources received from UE-A.    This is by default implied by current agreement   * *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* |
| Apple | Option 4 | Option 2 | No need to specify |  |
| LGE | Option 2 | Option 2 | Option 2 | It would be better to avoid that the number of excluded resources is too high. It may lead to infinity loop of RSRP threshold boosting or SL transmission on high interference resources. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 3 | Option 3 | Option 3 |  |
| ZTE |  |  |  | Similar as above question. |
| NEC | Option 4 | Option 1 | Option 1 |  |
| vivo | Option 2 with comment | Option 2 with comment | Option 2 with comment | All the options can work, option 2 incur less spec. impact, which is preferred.  Moreover, we need to further clarify when UE-B use the non-preferred resource, “for its resource selection for a TB to be transmitted to the UE-A” seems applied for unicast case. We propose the following cases.   * If UE-B receives unicast IUC, UE-B use it for its resource selection for a TB to be transmitted to the UE-A. * If UE-B receives groupcast IUC, UE-B use it for its resource selection for a TB to be transmitted to the same destination ID as the IUC. * If UE-B receives broadcast IUC, UE-B use it for its resource selection for any TB transmission.(for broadcast, we think IUC is determined based on condition 1-B-1, no need to address HD issue, so no need to restrict the destination of the associated TB transmission). |
| NTT DOCOMO | Option 3 | Option 3 | Option 3 |  |
| Fraunhofer | Option 3 | Option 3 | Option 3 |  |
| Ericsson | Option 1 and Option 3 | Option 1 and Option 3 | Option 1 and Option 3 | For the case of non-preferred resources the available resources do not change as fast as for the case of preferred resources, therefore, we propose to use either the latest resource set or combine the set of resources received by UE-B. |
| CMCC | Option 3 | Option 3 | Option 3 |  |
| Spreadtrum | Option 4 | Option 1 | Option 1 |  |
| OPPO | Option 1 | Option 1 | Option 1 | As Q7-1 |
| Nokia, NSB | Option 1 | Option 1 | Cannot happen since same UE-A can’t transmit more than one IUC message simultaneously in the same slot. |  |
| Huawei, HiSilicon | Option 5 | Option 5 | Option 5 | As explained in Q7-1, to simplify the solution and have unified design for all cases, we suggest the following proposal  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility | Comment | Option 2 | Option 2 | Why UE-B transmit second explicit request when IUC for the first explicit request was yet to be received. It should be handled similar to CSI, where there is no parallel processing. |
| Xiaomi | Option 4 | Option 4 | Not supported | The same comment as last question. |
| CATT, GOHIGH | Option 4 | Option 1 | Comment | Similar behaviors as preferred resource set of Q7-1. |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: Samsung, InterDigital, Ericsson, OPPO, Nokia,
  + Option 2: LGE, vivo,
  + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC,
  + Option 4: Futurewei, Apple, NEC, Spreadtrum, Lenovo, xiaomi, CATT,
  + Option 5:
    - Feedback aging criteria is used: Intel,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: Futurewei, Samsung, InterDigital, NEC, Ericsson, Spreadtrum, OPPO, Nokia, CATT,
  + Option 2: Apple, LGE, vivo, Lenovo,
  + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC,
  + Option 4: xiaomi,
  + Option 5:
    - Feedback aging criteria is used: Intel,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: Futurewei, InterDigital, NEC, Ericsson, Spreadtrum, OPPO,
  + Option 2: LGE, vivo, Lenovo,
  + Option 3: Qualcomm, Panasonic, DCM, Fraunhofer, Ericsson, CMCC,
  + Option 4:
  + Option 5:
    - Feedback aging criteria is used: Intel,
    - Not support this case: Samsung, Apple, Nokia, xiaomi,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + none of the resource sets is used: ZTE,

Q7-3: When UE-B receives both preferred resource set and non-preferred resource set from the same UE-A, what is UE-B’s behavior?

* Option 1: UE-B uses the latest received one between 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.
* Option 2: UE-B determines one of the received preferred resource set and non-preferred resource set from the same UE-A by its implementation for its resource selection for a TB to be transmitted to the 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.
* Option 4: UE-B does not expect to receive both preferred resource set and non-preferred resource set from the same UE-A for its resource selection for the same TB transmission to be transmitted to the UE-A.
* Option 5: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | 1. Procedures to determine preferred and non-preferred resource sets based on feedback received from the same or different UE needs to be defined. 2. Both resource sets can be used/formed based on preconfigured criteria. 3. If resource is a part of both sets then it is considered as non-preferred resource   Intention of Option 3 is reasonable and details need to be specified |
| Futurewei | 3 | 3 | 3 | If UE-A sends both sets, it is better that UE-B utilizes both. Particularly for IUC triggered by request, UE-B can request both preferred and non-preferred resource set, UE-B then expects that UE-A sends both sets. |
| Samsung | Option 1 | Option 1 | Not supported |  |
| InterDigital | 5 | 5 | 5 | We think it is possible a UE-A sends a preferred resource set followed by a non-preferred set when UE-A detects one or a few previously indicated preferred resources become non-preferred resources, e.g., due to scheduled transmissions. This can in some scenarios save signaling compared to send another preferred resource set. So it is beneficial to perform “Option 5: UE-B uses both the latest 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.” |
| Qualcomm | Option 4 | Option 4 | Option 4 | This case illustrates the issue of enabling both preferred and non-preferred resources in the same pool. We propose to add RRC parameters to enable/disable them separately. |
| Apple | Option 4 | Option 4 | No need to specify |  |
| LGE | Option 3 | Option 3 | Option 3 | It is understood that it is supported by a combination of the existing agreements. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 3 | Option 3 | Option 3 |  |
| ZTE |  |  |  | Similar as the above question  Up to UE-B implementation to use, just one of , both of, or non of the received IUC information. |
| NEC | Option 3 | Option 3 | Option 3 |  |
| vivo | Option 2 with comment | Option 2 with comment | Option 2 with comment | All the options can work, option 2 incur less spec. impact, which is preferred.  But “for a TB to be transmitted to the UE-A” needs to be modified as commented for Q7-2 |
| NTT DOCOMO | Option 3 | Option 3 | Option 3 |  |
| Fraunhofer | Option 4 | Option 3 | Option 3 | If UE-B receives both preferred and non-preferred resource sets, it is advantageous for UE-B to use both, as long as they are valid and useful for UE-B to determine its resource set for transmissions.  Unclear how/why UE-A would send both resource sets on receiving a request from UE-B. |
| Ericsson | Option 3 | Option 3 | Option 3 | The UE should use all the information available in order to get an accurate information of the free/busy resources. |
| CMCC | Option 4 | Option 4 | Option 4 |  |
| Spreadtrum | Option 4 | Option 4 | Option 4 |  |
| OPPO | Option 1 | Option 1 | Option 1 | Same as Q7-1 |
| Nokia, NSB |  |  | Cannot happen since same UE-A can’t transmit more than one IUC message simultaneously in the same slot. |  |
| Huawei, HiSilicon | Option 5 | Option 5 | Option 5 | As explained in Q7-1, to simplify the solution and have unified design for all cases, we suggest the following proposal  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility | Option 2 | Option 2 | Option 2 | Should be left to UE implementation how to handle it |
| xiaomi | Option 3 or 4 | Option 3 or 4 | No need to specify | No additional agreement or conclusion is needed. |
| CATT, GOHIGH | Option 4 | Option 4 | Option 4 |  |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: Samsung, OPPO,
  + Option 2: vivo, Lenovo,
  + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Ericsson, xiaomi,
  + Option 4: Qualcomm, Apple, Fraunhofer, CMCC, Spreadtrum, xiaomi, CATT,
  + Option 5:
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + Option 3 + none of the resource sets is used: ZTE,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: Samsung, OPPO,
  + Option 2: vivo, Lenovo,
  + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Fraunhofer, Ericsson, xiaomi,
  + Option 4: Qualcomm, Apple, CMCC, Spreadtrum, xiaomi, CATT,
  + Option 5:
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + Option 3 + none of the resource sets is used: ZTE,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: OPPO,
  + Option 2: vivo, Lenovo,
  + Option 3: Intel, Futurewei, InterDigital, LGE, Panasonic, NEC, DCM, Fraunhofer, Ericsson,
  + Option 4: Qualcomm, CMCC, Spreadtrum, CATT,
  + Option 5:
    - Not support this case: Samsung, Apple, xiaomi,
    - Up to UE-B’s implementation: Fujitsu, Huawei,
    - Option 2 + Option 3 + none of the resource sets is used: ZTE,

Q7-4: When UE-B receives multiple preferred resource sets from the different UE-As, what is UE-B’s behavior?

* Option 1: UE-B uses each received preferred resource set for its resource selection for a TB to be transmitted to each UE-A providing the preferred resource set.
* Option 2: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | Option 2. UE forms preferred set of resources considering feedback from multiple Ues Only feedback from target RX Ues is considered. |
| Futurewei | 1 | 1 | 1 |  |
| Samsung | Option 2 | Option 2 | Option 2 | UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE. |
| InterDigital | 1 | 1 | 1 |  |
| Qualcomm | Option 1 | Option 1 | Option 1 | We would like to clarify that “a TB” means there are multiple TB-s, one for each UE-A in a unicast manner. |
| Apple | Option 2 | Option 2 | No need to specify | All the received preferred resource sets can be combined to a single preferred resource set, e.g., by taking the union of these sets. |
| LGE | Option 1 | Option 1 | Option 1 | It is straightforward to adopt option 1 since only unicast is supported for preferred resource set indication. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 1 | Option 1 | Option 1 |  |
| ZTE |  |  |  | Similar as above question.  Up to UE-B implementation. |
| NEC | Option 2 | Option 2 | Option 2 | Use the union or combined one. |
| vivo | 1 | 1 | 1 |  |
| NTT DOCOMO | Option 1 | Option 1 | Option 1 |  |
| Fraunhofer | Option 1/2 | Option 1/2 | Option 1/2 | * If UE-B receives multiple IUC messages from different UE-As that pertain to different intended transmissions, we support option 1. * If UE-B receives multiple IUC messages from different UE-As that pertain to the same transmission to one of the UE-As, then UE-B should consider only the IUC that was sent from the UE-A which is the intended recipient.   If UE-B receives multiple IUC messages from different UE-As that pertain to the same transmission to another UE-C, then UE-B should combine the received IUC messages. |
| Ericsson | Option 2 | Option 2 | Option 2 | 1. UE-B uses the intersection of the received preferred resource sets from UE-A(s) |
| CMCC |  |  |  | In our views, different options may be dependent on different scenarios / use cases.  For example, if UE-B has different unicast links with multiple UE-As, then apparently, Option 1 should be adopted.   1. On the other hand, if a UE-B requests multiple UE-As to provide IUC information for a single TB, then in such a case, an intersection of preferred resource set should be used for resource (re)selection procedure at UE-B. |
| Spreadtrum | Option 1 | Option 1 | Option 1 |  |
| OPPO | Option 1 | Option 1 | Option 1 | Preferred resource set determined by one UE-A may be different from that determined by another UE-A |
| Nokia, NSB | 1 | 1 | 1 |  |
| Huawei, HiSilicon | Option 2 | Option 2 | Option 2 | As explained in Q7-1, to simplify the solution and have unified design for all cases, we suggest the following proposal  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility |  |  |  | Option 2; UE implementation |
| Xiaomi | Option1 | Option1 | Option 1 |  |
| CATT, GOHIGH | Option 1 | Option 1 | Option 1 |  |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT,
  + Option 2:
    - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer,
    - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, Apple, NEC, Ericsson, CMCC,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT,
  + Option 2:
    - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer,
    - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, Apple, NEC, Ericsson,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: Futurewei, InterDigital, Qualcomm, LGE, Panasonic, vivo, DCM, Fraunhofer, Spreadtrum, OPPO, Nokia, CMCC, xiaomi, CATT,
  + Option 2:
    - UE-B determines a final preferred resource set by combining all the received preferred resource sets from the target RX UEs. UE-B uses the final preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, Fraunhofer,
    - UE-B uses all received preferred resource set for its resource selection for a TB to be transmitted to any UE: Samsung, , NEC, Ericsson,
    - Not support this case: Apple,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei, Lenovo,

Q7-5: When UE-B receives multiple non-preferred resource sets from the different UE-As, what is UE-B’s behavior?

* Option 1: UE-B determines a final non-preferred resource set by combining 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.
* Option 2: UE-B uses each received non-preferred resource set for its resource selection for a TB to be transmitted to each UE-A providing the non-preferred resource set.
* Option 3: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | Option 2. UE forms non-preferred set of resources considering feedback from multiple Ues. Only feedback from target RX Ues is considered.  Non-preferred resources corresponding to Condition 1-B-2 are filtered out by UE-B in case of broadcast transmissions |
| Futurewei | 1 | 1 | 1 | For non-preferred resources, we have option 2 for condition 1-B-1. In this case, UE-B may need to use the non-preferred resource for transmissions to other UE’s. |
| Samsung | Option 1 | Option 1 | Option 1 | Update to option 1:  UE-B determines a final non-preferred resource set by combining 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~~ to any UE |
| InterDigital | Unicast: Option 2  Groupcast:  Option 1 + Option 3 | Unicast: Option 2  Groupcast:  Option 1 + Option 3 | Unicast: Option 2  Groupcast:  Option 1 + Option 3 | We think Option 1 is feasible for a groupcast transmission when all UE-As providing the non-preferred resource information are within MCR (Option 3).  Also, Option 2 applies to unicast transmission from UE-B to a UE-A providing non-preferred resource information, i.e. other UE-A’s non-preferred resource are not relevant. |
| Qualcomm | Option 1 | Option 1 | Option 1 | We understand combining non-preferred resources to mean a union of the sets of non-preferred resources received from UE-A.  This is by default implied by current agreement   * *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* |
| Apple | Option 1 | Option 1 | No need to specify | The union of these non-preferred resource sets can be considered as the final non-preferred resource set. |
| LGE | Option 2 | Option 2 | Option 2 | It would be better to avoid that the number of excluded resources is too high. It may lead to infinity loop of RSRP threshold boosting or SL transmission on high interference resources. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 1 | Option 1 | Option 1 |  |
| ZTE |  |  |  | Similar as above question.  Up to UE-B implementation |
| NEC | 1 | 1 | 1 |  |
| vivo | Option 1 with comment | Option 1 with comment | Option 1 with comment | Direction of option 1 should be OK, but “combining all the received non-preferred resource sets” seems problematic, since the amount of non-preferred resources may be too large. How about to say: It up to UE-B implementation t selects a sub-set of non-preferred resource(s) from all the received non-preferred resource sets.  Also, “for a TB to be transmitted to the UE-A” needs to be modified as commented for Q7-2 |
| NTT DOCOMO | Option 1 | Option 1 | Option 1 |  |
| Fraunhofer | Option 2/1 | Option 2/1 | Option 2/1 | * If the IUC messages are received for different TBs and different intended receivers, the combination of all received IUC messages will not work well since each of these messages are sent by different UE-As facing different prevalent conditions. Hence for this scenario we support option 2.   If the IUC messages are meant for the same intended receiver, then we support Option 1. |
| Ericsson | Option 1 | Option 1 | Option 1 | 1. UE-B uses the combination, i.e., union, of the received non-preferred resource sets from UE-A(s). |
| CMCC | Option 1 | Option 1 | Option 1 |  |
| Spreadtrum | Option 1 | Option 1 | Option 1 |  |
| OPPO | Option 3: up to UE-B implementation | Option 3: up to UE-B implementation | Option 3: up to UE-B implementation | As condition(s) used to determine the resource set is not indicated in the IUC information, i.e., UE-B does not know whether the resources are determined based on Option 1 or Option 2 of condition 1-B-1 or condition 1-B-2, and in one set, resources may be selected based on different conditions. For simplicity we suggest to leave the issue to UE-B implimentation. |
| Nokia, NSB | Option 1 | Option 1 | Option 1 | Note that this can lead to excessive resource exclusion and an infinite loop in resource selection. This issue needs to be addressed separately.  It is somewhat problematic that there is no differentiation according to the condition which resulted in a resource becoming non-preferred. |
| Huawei, HiSilicon | Option 3 | Option 3 | Option 3 | As explained in Q7-1, to simplify the solution and have unified design for all cases, we suggest the following proposal  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility |  |  |  | * Option 2 |
| Xiaomi | Option 2 | Option 2 | Option 2 |  |
| CATT, GOHIGH | Option 2 | Option 2 | Option 2 |  |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: Futurewei, Samsung, Qualcomm, Apple, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia,
  + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 3:
    - Option 1+MCR: InterDigital(for groupcast),
    - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: Futurewei, Samsung, Qualcomm, Apple, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia,
  + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 3:
    - Option 1+MCR: InterDigital(for groupcast),
    - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: Futurewei, Samsung, Qualcomm, Panasonic, NEC, vivo, DCM, Fraunhofer, Ericsson, CMCC, Spreadtrum, Nokia,
  + Option 2: Intel, LGE, InterDigital(for unicast), Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 3:
    - Option 1+MCR: InterDigital(for groupcast),
    - Not support this case: Apple,
    - Up to UE-B’s implementation: Fujitsu, ZTE, OPPO, Huawei,

Q7-6: When UE-B receives both preferred resource set and non-preferred resource set from the different UE-As, what is UE-B’s behavior?

* Option 1: UE-B uses the received preferred resource set 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.
* 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.
* Option 3: Others (please specify it)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Option(s) for IUCs triggered by UE-B’s request | Option(s) for IUCs triggered by other condition | Option(s) when receiving IUC triggered by UE-B’s request and IUC triggered by other condition simultaneously | Comments |
| Intel |  |  |  | Same procedures as described for Q7-4/Q7-5 are used to form preferred and non-preferred resource sets. |
| Futurewei | 2 | 2 | 2 | For non-preferred resources, we have option 2 for condition 1-B-1. In this case, UE-B may need to use the non-preferred resource for transmissions to other UE’s. |
| Samsung | Option 3 | Option 3 | Option 3 | 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 any UE. |
| InterDigital | Unicast:  Option 1  Groupcast:  Option 3 | Unicast:  Option 1  Groupcast:  Option 3 | Unicast:  Option 1  Groupcast:  Option 3 | Option 3:  UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group.  For groupcast, UE-B shouldn’t apply any information from UE-A outside MCR. For broadcast, UE-B may combine the information received from multiple UE-As. |
| Qualcomm | Option 3 | Option 3 | Option 3 | This case illustrates the issue of enabling both preferred and non-preferred resources in the same pool. We propose to add RRC parameters to enable/disable them separately and we do not support enabling both in the same pool. |
| Apple |  |  |  | We do not expect this case is specified. |
| LGE | Option 1 | Option 1 | Option 1 | We prefer to reuse the same principle of Q7-4/Q7-5. |
| Fujitsu |  |  |  | For simplicity, all of these can be determined by UE-B’s implementation. |
| Panasonic | Option 2 | Option 2 | Option 2 |  |
| ZTE |  |  |  | Up to implementation |
| NEC | Option 3 | Option 3 | Option 3 | The union one or combined ones are used. |
| vivo | Option 3 | Option 3 | Option 3 | Share view as Intel, same procedures as described for Q7-4/Q7-5. Either preferred resource or non-preferred resource will be used, no strong motivation to mixed the different resource type for a given TB transmission. |
| NTT DOCOMO | Option 3 | Option 3 | Option 3 | Combination of solutions for the previous scenarios. |
| Fraunhofer | Option 1 | Option 1 | Option 1 | When UE-B receives both types of resource from different UE-As that pertain to different intended transmissions, we support Option 1. |
| Ericsson | Option 3 | Option 3 | Option 3 | Combination of the previous questions. UE-B uses the combination of the received non-preferred resource sets and the intersection of preferred resource sets from UE-A(s). |
| Spreadtrum | Option 3 | Option 3 | Option 3 | Combine the procedure of Q7-1 – Q7-5 |
| OPPO |  |  |  | As Q7-5, it is up to UE-B to use non-preferred resource set from other UE-A, following is suggested:   * Option 1: UE-B uses the received preferred resource set for its resource selection for a TB to be transmitted to the UE-A providing the preferred resource set, it is up to UE-B to use received non-preferred resource set from other UE-A. 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 to use received non-preferred resource set from other UE-A. |
| Huawei, HiSilicon | Option 3 | Option 3 | Option 3 | As explained in Q7-1, to simplify the solution and have unified design for all cases, we suggest the following proposal  *Proposal: When UE-B receives multiple inter-UE coordination information from the same UE-A or different UE-As, it is up to UE-B implementation to use one or multiple of them in its resource (re)selection.* |
| Lenovo/Motorola Mobility |  |  |  | Option 1 |
| Xiaomi | Option 1 | Option 1 | Option 1 |  |
| CATT, GOHIGH | Option 1 | Option 1 | Option 1 |  |

**FL’s observation of 1st email discussion:**

* UE-B receives inter-UE coordination information triggered by UE-B’s request:
  + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 2: Futurewei, Panasonic, DCM,
  + Option 3:
    - UE-B uses both the received preferred resource set and non-preferred resource set from target RX UEs for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo,
    - 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 any UE: Samsung, NEC, Ericsson,
    - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast),
    - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm,
    - Not support this case: Apple,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei,
    - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO,
* UE-B receives inter-UE coordination information triggered by a condition other than explicit request reception:
  + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 2: Futurewei, Panasonic, DCM,
  + Option 3:
    - UE-B determines a final preferred resource set by combining both the received preferred resource set and non-preferred resource set from the target RX UEs. UE-B uses the final preferred resource set and final non-preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo,
    - 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 any UE: Samsung, NEC, Ericsson,
    - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast),
    - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm,
    - Not support this case: Apple,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei,
    - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO,
* UE-B receives both inter-UE coordination information triggered by UE-B’s request and inter-UE coordination information triggered by a condition other than explicit request reception
  + Option 1: InterDigital(for unicast), LGE, Fraunhofer, Lenovo, xiaomi, CATT,
  + Option 2: Futurewei, Panasonic, DCM,
  + Option 3:
    - UE-B determines a final preferred resource set by combining both the received preferred resource set and non-preferred resource set from the target RX UEs. UE-B uses the final preferred resource set and final non-preferred resource set for its resource selection for a TB to be transmitted to the target RX UEs: Intel, vivo,
    - 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 any UE: Samsung, NEC, Ericsson,
    - UE-B uses both the received preferred resource set and non-preferred resource set from different UE-As within MCR distance for its resource selection for a TB to be transmitted to the group: InterDigital(for groupcast),
    - Not support enabling both preferred resource set and non-preferred resource set in the same pool: Qualcomm,
    - Not support this case: Apple,
    - Up to UE-B’s implementation: Fujitsu, ZTE, Huawei,
    - Option 1+ Up to UE implementation using non-preferred resource set from different UE-A: OPPO,

**FL’s observation:**

Some companies proposed to modify the sensing window for determining the set of resources depending on the time location of UE-A’s inter-UE coordination information transmission. For this approach, **FL understands that deciding/finalizing the contents of inter-UE coordination information after the beginning of a resource selection window used for selecting TX resources of inter-UE coordination information will lead to change the current MAC specification in terms of MAC PDU generation procedure, which is not desirable at the last stage of this WI.** There is a company proposing to specify the sensing window for determining the set of resources depending on the beginning of a resource selection window for inter-UE coordination information transmission. On the other hand, a company proposed not to change further for the sensing window for determining the set of resources.

Q8: Which option is preferred for sensing window for determining the set of resources?

* Option 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.
* Option 2: Sensing window for determining the set of resources starts at n-T\_0-T\_proc,1 and ends at n-T\_proc,0-T\_proc,1 where n is the slot location of UE-A’s inter-UE coordination information transmission
* Option 3: Sensing window for determining the set of resources starts at n-T\_0-T\_3 and ends at n-T\_proc,0-T\_3 where n is the slot location of UE-A’s inter-UE coordination information transmission
* Option 4: Sensing window for determining the set of resources ends at n-T\_proc,0-T\_proc,1 where n is the slot location of the beginning of a resource selection window for UE-A’s inter-UE coordination information transmission
* Option 5: Others (please specify it)

|  |  |  |
| --- | --- | --- |
| Company | Option(s) | Comments |
| Intel | Option 1 |  |
| Futurewei | 5 | Sensing window, particularly the end of sensing window, should depend on n+T\_1 which either provided by request or determined by UE-A. In request-based IUE, we have information n+T\_1 but not n and T\_1. Therefore, options 2,3,4 are not appropriate. Since we need to accommodate the processing time at UE-A and the transmission time of coordination transmission, we need to update the sensing end time (option 1 is not appropriate). We propose addition offset Tr> Tproc,1 for the end sensing time.  For UE-B’s transmissions of both periodic traffic and aperiodic traffic   * UE-A sensing for coordination information ends by n+T1 - Tr - Tproc,0 , where Tr> Tproc,1 * Sensing for aperiodic traffic is performed within 31 logical slots earlier than n+T1. |
| Samsung | Option 3 or Option 1 | Slightly prefer Option 3 but Option 1 is O.K if there is no consensus. |
| InterDigital | Option 1 | With explicit request IUC, it is agreed to include RSW in the request and UE-A will base the sensing window on this information. With condition-triggered IUC, as we indicated in Q1-1, the RSW can be left to UE implementation and accordingly no further spec change is necessary for the sensing window determination. |
| Qualcomm |  | We would like to add this sub-bullet under Option 1   * Option 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.   + n is the slot of the inter-UE coordination message transmission, in the case when inter-UE coordination message is triggered by condition other than explicit request. |
| ETRI | Option 1 |  |
| Apple | Option 1 | We are fine that UE-A determines the contents of IUC first, and then selects the resources for IUC transmission.  When determining the resources for IUC transmission, we need to specify the PDB and/or resource selection window. |
| LGE | Option 1 | Further optimization is deprioritized in this stage. |
| Fujitsu | Option 1 |  |
| Panasonic | Option 1 |  |
| ZTE | Option 1 |  |
| NEC | Option 1 |  |
| vivo | Option 1 | UE-A can determine slot n after the coordination signaling, before slot n, it is assumed that UE-A performs sensing continuously, then the whole procedure in section 8.1.4 does not change. |
| NTT DOCOMO | Option 1 |  |
| Fraunhofer | Option 1 |  |
| Ericsson | Option 5 | We are supportive of maintaining the same procedure for the sensing window as we have, i.e., the sensing is performed based on the resource selection window. However, one important factor to consider is the sensing time that UE-A has performed.  Based on the LS from RAN2 where they indicate that IUC in SL-DRX is deprioritized, we consider that from RAN1 perspective, we need to capture the UE behavior under this assumption of power saving, e.g., partial sensing. Therefore, we propose to indicate that in case the amount of sensing performed by UE-A is below a certain threshold, the inter-UE coordination message is not transmitted by UE-A, and in case of being transmitted it is discarded by UE-B. |
| CMCC | Option 1 |  |
| Spreadtrum | Option 1 |  |
| OPPO | Option 1 |  |
| Nokia, NSB | Option 1 |  |
| Huawei, HiSilicon | Option 2 | Option 2 ensures UE-A can use the latest sensing results to guarantee the validity of coordination information and is supported.  We are not very clear about the meaning of Option 1, does it mean the sensing window for determining the set of resources is [n + T\_1 - T0, n + T\_1 – Tproc,0] in Option 1?  The meaning of n in Option 1, 2/3, 4 are different.  To help discussing, we suggest to use unified symbols in each option so that companies can quickly know the difference of each option. For example, maybe we can consider the following typical timeline:   * Slot r: slot where UE-A receives the explicit request, or condition is met in non-explicit request case   + Assume the start/end slot of RSW is m1, m2, respectively. * Slot n: slot where UE-A sends the coordination information * Slot k: slot where 1st preferred/non-preferred resource locates   Then, maybe we update Option 1~5 using the notations above. |
| Lenovo/Motorola Mobility | Option 1 |  |
| Xiaomi | Option 1 or option 3 |  |
| CATT, GOHIGH | Option 1 |  |

**FL’s observation of 1st email discussion:**

* Option 1: Intel, Samsung, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, CMCC, Spreadtrum, OPPO, Lenovo, xiaomi, CATT,
  + For inter-UE coordination information triggered by a condition other than explicit request reception, n is the slot of the inter-UE coordination information transmission: Qualcomm,
* Option 2: Huawei,
* Option 3: Samsung, xiaomi,
* Option 4:
* Option 5:
  + End of sensing window is Tr ealier than n+T\_1 indicated by UE-B’s request: Futurewei,
  + Condition of skipping inter-UE coordination information based on sensing status: Ericsson,

**FL’s observation:**

Some companies proposed to introduce 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. Note that according to the guideline from RAN#94 and RAN1 chairman, RAN1 should strive for avoiding the introduction of new RRC parameter unless its absolute essentiality is sufficiently justified.

Q9: Which option is preferred 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?

* Option 1: No further decision is necessary.
* Option 2: UE-A determines the priority value by its implementation.
* Option 3: UE-A determines the priority value by its implementation with (pre)configured lower limit.
* Option 4: The priority value is fixed to 8.
* 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.
* Option 6: Others (please specify it).

|  |  |  |
| --- | --- | --- |
| Company | Option(s) | Comments |
| Intel | Option 1 or Option 4 or Option 6 | Option 6: Default value is used |
| Futurewei | Option 2 | UE-A can obtain priority value from UE-B’s prior SCI as in Scheme 2. |
| Samsung | Option 1 |  |
| InterDigital | Option 5 with comment | * Option 5: The priority value is the same as the priority value indicated by ~~other UE’s SCI~~ the latest UE-B’s SCI previously received by UE-A that is used to determine the non-preferred resource set. |
| Qualcomm | Option 1 or 4 | Option 4 is our second preference. |
| ETRI | Either Option 1 or Option 4 |  |
| Apple | Option 1 | For IUC triggered by a condition other than explicit request reception, the resource pool always (pre)configures the priority value of IUC transmission. Hence, no need of further discussion. |
| LGE | Option 1 |  |
| Fujitsu | Option 2 |  |
| Panasonic | Option 3 | Lowest limit can avoid the UE-A select lower priority value (higher priority) of inter-UE coordination more than necessary by UE-A’s implementation. |
| ZTE | Option 1 |  |
| NEC | Option 1 |  |
| Vivo | Option 1 |  |
| NTT DOCOMO | 1 or 4 | Option 4 is the first preference. |
| Fraunhofer | Option 5 | We are supportive of the change by InterDigital. |
| Ericsson | Option 6 or Option 4 | If transmitted together with data, priority is given by data. Our second priority is Option 4. |
| CMCC | Option 5 |  |
| Spreadtrum | Option 1 or Option 4 |  |
| OPPO | Option 1 |  |
| Nokia, NSB | Option 5, Option 2 |  |
| Huawei, HiSilicon | Option 2 | If the priority value is not (pre-)configured, let UE-A determines the priority value by UE implementation works and is enough. There is no need to consider other sophisticated design.  Option 1 leaves the specification incomplete for the case if the priority value is not (pre)configured. |
| Lenovo/Motorola Mobility | Option 1 |  |
| xiaomi | Option 2 |  |
| CATT, GOHIGH | Option 1 |  |

**FL’s observation of 1st email discussion:**

* Option 1: Intel, Samsung, Qualcomm, ETRI, Apple, LGE, ZTE, NEC, vivo, DCM, Spreadtrum, OPPO, Lenovo, CATT,
* Option 2: Futurewei, Fujitsu, Nokia, Huawei, xiaomi,
* Option 3: Panasonic,
* Option 4: Intel, Qualcomm, ETRI, DCM, Ericsson, Spreadtrum,
* Option 5: CMCC, Nokia,
* Option 6:
  + Default value: Intel,
  + Priority value indicated by the latest UE-B’s SCI: InterDigital, Fraunhofer,
  + Priority of other data to be multiplexed with inter-UE coordination information: Ericsson,

**FL’s observation:**

According to RAN2 LS R1-2200880, RAN2 already agreed that “**Inter-UE coordination (IUC) issues (on which) RAN2 mainly relies on RAN1: Cast types (UC/GC/BC) of inter-UE coordination**”. Considering this RAN2 agreement, FL understands that RAN1 needs to have further discussion on FFS points of the following WA.

|  |
| --- |
| *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* |

Q10: Which option is preferred for the conditions for cast type(s) of inter-UE coordination information transmission triggered by a condition other than explicit request reception?

* Option 1: Only cast type(s) available at UE-A for other data transmission can be used for cast type(s) for the inter-UE coordination information transmission
  + Note: it is applied to both when the inter-UE coordination information is multiplexed with other data and when the inter-UE coordination information is not multiplexed with other data
* Option 2: Others (please specify it)

|  |  |  |
| --- | --- | --- |
| Company | Option(s) | Comments |
| Intel | Comment | Intention of Option 1 is OK for simplicity. We are not clear how cast type is determined for the case when the inter-UE coordination information is not multiplexed with other data. It needs to be clarified |
| Futurewei | comments | Since we have the following agreement in 107b-e, whether IUC information multiplexed with data when the source/destination ID pair is the same. So multiplex data is dependent on the transmission of coordination information not the other way around. Therefore, we prefer cast types regardless the cast types for other data transmission available at UE-A.   * 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 |
| Samsung | comments | 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.* |
| InterDigital | Option 1 | We think Option 1 is acceptable given we have limited time to finish. |
| Qualcomm | Option 2 | Only cast type(s) available at UE-A for other data transmission can be used for cast type(s) for the inter-UE coordination information transmission when the inter-UE coordination information is multiplexed with other data.  When the inter-UE coordination information is not multiplexed with other data, unicast is used for preferred set of resource and broadcast is used for non-preferred set of resource. |
| Apple | comments | We do not think any restriction is needed on the two FFS sub-bullets in the working assumption. |
| LGE | Option 1 | In our view, if inter-UE coordination information is not multiplexed with other data, UE-A will determine the cast type of inter-UE coordination information transmission by its implementation among cast type(s) available for other data of UE-A.  Moreover, additional (pre)configuration should be deprioritized unless the system is broken. |
| Fujitsu | Option 1 | We are generally fine with the proposal. |
| ZTE |  | Option 1 is OK for us, and share similar view with Intel, clarification is needed on the case when IUC information is not multiplexed with other data. |
| vivo | Comment | Option 1 seems OK for non-preferred resource. Furthermore, the cast type is also associated with the condition to determine the non-preferred resource, e.g., when the non-preferred resource is determined based on condition 1-B-1, any cast type can be used, when non-preferred resource is determined based on condition 1-B-2, only unicast/groupcast can be used and slots of the reserved resource is also used as non-preferred resource. |
| NTT DOCOMO |  | We are not sure further agreement is necessary. But if needed, when multiplexed with data, the cast type should be used. When not multiplexed with data, any cast type would be OK. |
| Fraunhofer | Option 2 | We do not think any further condition is required. Also Option 1 is unclear as mentioned by Intel. |
| Ericsson | Option 2 | In our view, one important factor to consider when groupcast/broadcast of inter-UE coordination message is supported, it is the issue of signalling overload. Therefore, we propose to restrict the use of non-preferred resources to the case when the distance between the UE-B and UE-A(s) is below a certain threshold |
| CMCC | Option 2 | For Condition 1-B-1 to determine the non-preferred resource set, broadcast/groupcast can be used for IUC if not multiplexed with data. Otherwise, unicast is used. |
| Spreadtrum | Option 1 with comments | When the inter-UE coordination information is multiplexed with other data, we support option 1.  When the inter-UE coordination information is not multiplexed with other data, only unicast is supported for preferred resource set. And we should further clarify how to determine the cast type for non-preferred resource set. |
| OPPO | Option 1 with comments | Fine with Option 1 basically, but the discussion is only for non-preferred resource set in our view, as for preferred resource set, only unicast is used. |
| Nokia, NSB | Option 1 | However, it is not clear if/how Option 1 works for standalone IUC transmission |
| Huawei, HiSilicon | No need for further discussions | Given the newly made conclusion below, we think there is no need for further discussions. No additional conditions are necessary. RAN1 can stop the discussions about this WA.  In additions, the conditions for supporting groupcast and broadcast needs to be decided by RAN2/SA2. RAN2 already triggered some discussions (R2-2203159 Proposal 6-1).  ==  **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 |
| Lenovo/Motorola Mobility | Option 1 |  |
| Xiaomi | Option1 |  |
| CATT, GOHIGH | Option 1 |  |

**FL’s observation of 1st email discussion:**

* Option 1: Intel, InterDigital, Qualcomm(when inter-UE coordination information is multiplexed with other data), LGE, Fujitsu, ZTE, vivo(for non-preferred resource set), Spreadtrum, OPPO, Nokia, Lenovo, xiaomi, CATT,
* Option 2:
  + Additional (pre)configuration enabling groupcast inter-UE coordination information: Samsung,
  + Unicast is used only when UE-A has data to be multiplexed and transmitted to UE-B: Samsung, CMCC,
  + Only unicast is used when inter-UE coordination information is not multiplexed with other data: Qualcomm,
  + Do no need to specify: Apple, DCM, Fraunhofer, Huawei,
  + Restrict the use of non-preferred resources based on distance between UE-A and UE-B: Ericsson,

Q11-1: Do you agree to 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 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*

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | Yes | We are ok given the agreement in the GTW |
| Samsung | Yes |  |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| LGE | Yes | With the WA, the system is not broken. Other optimization needs to be deprioritized in this stage. |
| Fujitsu | Yes | We support to confirm the working assumption. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| NEC | Yes |  |
| NTT DOCOMO | Yes |  |
| Ericsson | Yes |  |
| CMCC | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | ok |  |
| Xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Futurewei, Samsung, Qualcomm, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, DCM, Ericsson, CMCC, Spreadtrum, OPPO, Nokia, Huawei, xiaomi, CATT,

Q11-2: Do you agree following draft proposal for the maximum number of combinations to be conveyed on a SCI format 2-C?

Draft proposal:

* For following agreement, remove square brackets with replacing 3 with 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]* |

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | comment | We prefer to determine this after the detailed bit size discussion |
| Samsung |  | Agree with Futurewei’s comment |
| QUalcomm | Yes |  |
| Apple | Yes | Based on our calculation, the maximum number is 2. |
| L*GE* | YES | This decision will help the discussion in other parts as well. |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes |  |
| ZTE |  | Similar view as FW |
| NEC | Yes |  |
| NTT DOCOMO | Yes |  |
| Fraunhofer |  | Agree with Futurewei and Samsung, because we prefer to maintain N=3 for SCI 2-C to be able to carry more resources, if possible, dependent on the bit size discussion. |
| Ericsson | Yes |  |
| CMCC |  | Share similar views as FW. |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB |  | Let us finalize the field sizes first |
| Huawei, HiSilicon | Yes | As per the latest agreement, each slot offset will occupy up to 8 bits.  Then, N=2 combinations will make the SCI 2C size smaller than 140 bits, but N=3 cannot.  So we support N=2. |
| xiaomi | comment | We need to decide the detailed information fields in SCI 2-C firstly. |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Qualcomm, Apple, LGE, Fujitsu, Panasonic, NEC, DCM, Ericsson, Spreadtrum, OPPO, Huawei, CATT,
* Discuss it later: Futuerwei, Samsung, ZTE, Fraunhofer, CMCC, Nokia, xiaomi,
  1. **Scheme 2**

**FL’s observation:**

Some companies proposed to set the value of m\_CS differently between a resource conflict for current TB and a resource conflict for the next TB for UE-B’s periodic transmission. **FL understands that RAN1 already agreed that regardless of UE-B’s aperiodic/periodic transmissions, UE-B re-selects only resource(s) overlapping with the next reserved resources indicated by the corresponding its SCI for current TB transmission when the UE-B receives a conflict indicator for resource(s) indicated by its SCI. In that point of view, I think that it is straightforward that UE-A sends a resource conflict indicator only for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission in both UE-B’s aperiodic/periodic transmissions.**

Q12-1: Which option(s) is preferred for UE-A’s behavior of sending a resource conflict indicator to UE-B?

* Option 1: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0.
  + Note that for this option, UE-A does not transmit a resource conflict indicator for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission.
* Option 2: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0. m\_CS for a resource conflict indication for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission is 6.
* Option 3: m\_CS for a resource conflict indication for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission is 0. m\_CS for a resource conflict indication for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission is 0.
* Option 4: Others (please specify it)

|  |  |  |
| --- | --- | --- |
| Company | Option(s) | Comments |
| Intel | Option 1 or Option 2 |  |
| Futurewei | Option 1 | We do not have agreement on corresponding UE-B’s behavior for option 2 and 3. |
| Samsung | Option 1 or Option 3 |  |
| InterDigital | Option 2 | We think based on the RAN1 #107e agreement below, it is not guaranteed that “**UE-A sends a resource conflict indicator only for the next reserved resource indicated by the corresponding UE-B’s SCI for current TB transmission in both UE-B’s aperiodic/periodic transmissions**” as FL indicated will happen when Option 1 is configured, because in the same SCI, resources for current TB transmission and next TB transmission can be reserved. There will not be another SCI to reserve the resource for the initial transmission of the next TB. Thus, it is important to indicate which resource is in conflict at least for Option 1 below.  **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. |
| Qualcomm | Option 3 | Option 2 is also acceptable to us. |
| ETRI | Option 1 |  |
| Apple | Option 2 | To indicate the resource collision for the next TB transmission has the latency benefit. UE-B could reselect the resources in an earlier time (i.e., one period before) |
| LGE | Option 1 | Regarding the conclusion made in the last meeting, Option 2 needs to be deprioritized to avoid duplicated discussion on whether or not m\_CS is used to indicate time location of a resource conflict. |
| Fujitsu | Option 1 | We are fine with not supporting conflict indication for the next TB. |
| Panasonic | Option 1 | For option 2, when both current TB transmission and next TB transmission are conflicted, how to indicate it is unclear. |
| ZTE | Opion 1 | For the note of option 1, we have different understanding, it can be supported when PSFCH occasion is derived by the slot of the expected collision, i.e., the note should be:  *UE-A does not transmit a resource conflict indicator for the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission if PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted*. |
| vivo | Option 1 | Option 1 anyway should be supported when periodic reservation is disabled for the pool. However, we can compromise to option 2, when it can be enabled/disabled by configuration, we think conflict for current TB is more essential, since UE cannot predict whether there would be TB transmission or not in next period, redundant resource selection may occur. |
| NTT DOCOMO | Option 3 |  |
| Fraunhofer | Option 2 | We support the differentiation in the conflict indication between the reserved resources. |
| Ericsson | Option 1 | There is no need trigger reselection yet given that the reservation is for a second reservation. |
| Spreadtrum | Option 2 |  |
| OPPO | Option 1 | Prefer Option 1 for simplicity, as there are multiple reserved resources for next TB, seems Option 2 and 3 need more clarification if go to that direction. |
| Nokia, NSB | Option 2 | Option 1 implies that conflicts for periodic reservations are detected (based on agreed UE-A behavior) but not indicated, which seems an arbitrary downscoping of Scheme 2 and will degrade performance with no clear benefit in return.  Option 3 implies that UE-B has no way of knowing whether the conflict occurs in the next resource for current TB or resource reserved for next TB. If the conflict occurs on the resource reserved for next TB, then the agreement below will not work, as UE-B will exclude the wrong resources, so the feature is broken.   * *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.*     - *FFS: Whether/How the conflict in periodic transmission is indicated by UE-A and handled by UE-B* |
| Huawei, HiSilicon | Option 2 | As summarized in Section 3.2, quite a lot companies support to indicate more than one information. So a single m\_CS value is not feasible to convey all the information that companies are interested in.  We support Option 2, which can well address the collision of current TB and next TB.  As shown in the following Figure, assume UE B transmits a SCI in R1 and PSFCH occasion for indication is derived by SCI. Assume UE B’s SCI reserves retransmission resource R2 and periodic transmission R3.  Other UE may conflict with UE B’s retransmission resource R2 or periodic transmission resource R3. To ensure the reliability of UE B’s transmission, UE A shall detect and indicate either R2 or R3 is in conflict. As the PSFCH resource to indicate R2 and R3 are the same, a straightforward way is to distinguish conflict of R2 and R3 by using different m\_cs value, e.g. 0 and 6.    For option 3, it seems a single value cannot indicate both cases since UE-B cannot distinguish between them. |
| xiaomi | Option 1 or Option 3 | Based on the conclusion made in the last meeting, it is not necessary to distinguish the conflict happened on the second or the third reserved resource, so one m\_CS value is enough. |
| CATT, GOHIGH | Option 2 | The resource conflict in the reserved resource indicated by the corresponding UE-B’s SCI for next TB transmission should be indicated. |

**FL’s observation of 1st email discussion:**

* Option 1: Intel, Futurewei, Samsung, ETRI, LGE, Fujitsu, Panasonic, ZTE, vivo, Ericsson, OPPO, xiaomi, (12)
* Option 2: Intel, InterDigital, Qualcomm, Apple, Fraunhofer, Spreadtrum, Nokia, Huawei, CATT, (9)
* Option 3: Samsung, Qualcomm, DCM, xiaomi, (4)
* Option 4:

**FL’s observation:**

There is a company which proposed to specify how UE-B sets the value of resource reservation periodicity for the re-selected resource due to the resource conflict indicator reception in case of UE-B’s periodic transmission.

Q12-2: Do you agree following draft proposal for the UE-B’s behavior of setting the value of resource reservation periodicity for the re-selected resources due to the resource conflict indicator reception in case of UE-B’s periodic transmission?

Draft proposal:

* 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.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes |  |
| Futurewei | Yes | We are fine with this proposal. |
| Samsung | no | Benefit is not clear. This issue need to be de-prioritized than others. |
| InterDigital | Yes |  |
| Qualcomm | Yes | This can be a proposal for conclusion. |
| ETRI | Yes |  |
| Apple | Yes |  |
| LGE | Yes | It follows re-evaluation/pre-emption principles. |
| Fujitsu | Yes | We are also fine to not have this proposal. |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| NEC | Yes |  |
| Vivo | Yes |  |
| NTT DOCOMO | Yes |  |
| Ericsson |  | There is no need to include any extra procedure for UE-B’s resource reselection. It should follow the legacy procedure. |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | Yes | We prefer simple solution. |
| Lenovo/Motorola Mobility | yes |  |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Intel, Futurewei, InterDigital, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Spreadtrum, OPPO, Nokia, Huawei, Lenovo, xiaomi, CATT,
* No: Samsung,

**FL’s observation:**

For draft proposal 2-1, the followings are observed based on the submitted contributions.

* 1st sub-bullet of draft proposal 2-1:
  + Support: Huawei, CATT, DCM, Spreadtrum, Intel, Apple, Qualcomm, LGE, Ericsson, ZTE (10)
  + Not support: Panasonic, Samsung (2)
* 2nd sub-bullet of draft proposal 2-1:
  + Support: Huawei, CATT, Qualcomm, ZTE (3)
  + Not support: Futurewei, Samsung (2)

Q13: Do you agree following draft proposal for m\_0 determination in Scheme 2?

Draft proposal:

* 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

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Futurewei | Comment | We do not support second subbullet as there might be less or none PSFCH resources for conflict indication if different PRBs are configured. The configuration of PSFCH PRBs depends the pool configuration which cannot be completely rely on the pre-configuration by vendors. |
| Samsung | Yes |  |
| Qualcomm | Yes |  |
| ETRI | Yes |  |
| Apple | Yes |  |
| LGE | Yes | We are also fine to remove 2nd part if RAN1 pursue no specification enhancement for the case when the same PRBs are used between SL HARQ-ACK information and a resource conflict indication. |
| Fujitsu | Yes | We are fine with the proposal. |
| Panasonic | Yes | When 2nd sub -bullet is supported, we support 1st sub-bullet also. |
| ZTE | Yes |  |
| NEC | Yes |  |
| Vivo | Yes |  |
| NTT DOCOMO | Yes |  |
| Fraunhofer | Yes |  |
| Ericsson | Yes |  |
| Spreadtrum | Yes |  |
| OPPO | Yes with comments | The 2nd sub-bullet seems not so necessary, it has been suggested by the first sub-bullet, even same PRBs are configured by the network, no special handling for the case in specification. |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | Yes | Current proposal is simple and avoid a lot of new issues. We support it. |
| Lenovo/Motorola Mobility | Comment | Does it mean that for every PSFCH occasion there will be a preconfigured PRBs for conflict indication and HARQ-ACK.  A different PSFCH occasion for conflict indication may help to get sufficient resources for HARQ-ACK |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes | To minimize the interference to HARQ-ACK of Rel-16. If the same PRBs are (pre)configured, which will need an extra discussion for the index of PSFCH. |

**FL’s observation of 1st email discussion:**

* Yes: Samsung, Qualcomm, ETRI, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Fraunhofer, Ericsson, Spreadtrum, OPPO, Nokia, Huawei, xiami, CATT,
* No:
  + Do not support 2nd sub-bullet: Futurewei,

Q14: Do you agree following draft proposal for UE-B determination in Scheme 2?

**FL’s observation:**

For draft proposal 2-2, the followings are observed based on the submitted contributions.

* Support that UE pairing for selecting UE-B considers only UEs transmitting SCI format 1-A with Second UE flag (i.e., whether UE scheduling a conflict TB can be UE-B or not) of 1: Huawei, Panasonic, OPPO, CATT, DCM, LGE (6)
* Support that UE pairing for selecting UE-B considers only UEs whose PSFCH occasions for a resource conflict indication are not yet passed: Huawei, OPPO, Fujitsu, LGE (4)

Draft proposal:

* Confirm the following working assumption with modification in RED:
  + 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 Second UE 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 Second UE 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 | Comments |
| Futurewei | Comments | We are general fine with the proposal. However, we need to consider the following case   * 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 |
| Samsung | No | We don’t agree with the proposal. A more simple solution is to do the pairing without regard to flag or the passing of resource in time. At the last step if PSFCH is to be sent, and the time has passed or the UE doesn’t support conflict indication, PSFCH is not sent.  We think that the proposal can suffer from over exclusion |
| Qualcomm | Yes |  |
| Apple | No | We do not agree with the condition “whose PSFCH occasions for resource conflict indication are not yet passed”. We think this may lead to inconsistent UE-A’s behaviour in determining UE-B, depending on UE-A’s processing power, in case PSFCH occasion is derived from SCI.  Graphical user interface, timeline  Description automatically generated  Consider an example that UE-B1’s scheduling SCI for low priority data is sent in slot 1 and UE-B2’s scheduling SCI for high priority data is sent in slot 2. There is a potential resource collision between UE-B1 and UE-B2. The PSFCH occasion for UE-B1 is in slot 3 and the PSFCH occasion for UE-B2 is in slot 4.  According to the proposal, UE-A has to send IUC to UE-B1, since UE-B1 has low priority data and the PSFCH occasion has not yet passed.  However, if UE-A has a limited processing power and does not decode UE-B2’s SCI before PSFCH occasion in slot 3, then it will not send IUC to UE-B1. In this case, the condition “whose PSFCH occasions for resource conflict indication are not yet passed.” cannot be achieved by this UE-A.  Overall, this proposal may lead to different UE-As, depending on their processing power, determining different UE-Bs. This is not desired.  Hence, we propose that   * *If PSFCH occasion is derived by a slot where potential resource conflict occurs, a UE with the higher priority value is UE-B.*   *If PSFCH occasion is derived by a slot where UE-B’s scheduling SCI is transmitted, a UE which sends scheduling SCI in a later slot is UE-B.* |
| LGE | Yes | If this proposal is not acceptable, we are also fine to confirm the original working assumption as 2nd preference. |
| Fujitsu | Yes | We are fine with the proposal. Besides, it can happen that only one UE satisfied the PSFCH timeline requirement as in R1-2201438. It is better clarified that the UE satisfying the PSFCH timeline is UE-B. This is to avoid that no conflict indication is transmitted in this case. |
| Panasonic | Yes |  |
| Vivo |  | PSFCH occasion is the one associated with the scheduling SCI?  Before conflicted resource, there would be one/two PSFCH occasion(s) associated with the TB transmission, we need to clarify which PSFCH occasion is used. |
| NTT DOCOMO | Yes | Without the additional condition of “Second UE flag is set to 1”, the agreed working assumption at the last meeting for 1 bit indicator in SCI 1-A becomes meaningless.. |
| Ericsson |  | We are not completely sure about this proposal. Regarding the newly added text in red, shouldn’t it be the flag of the UE that becomes UE-B? |
| Spreadtrum | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Comment | One potential problem with this approach is that, depending on the configuration of pre-emption, the UE with the higher priority value may detect pre-emption by itself and sending a conflict indication to the UE with the lower priority value would then result in both involved UEs performing reselection, degrading system performance. |
| Huawei, HiSilicon | Yes | It is not always feasible to transmit the conflict indication to the one with higher priority value from a pair of UEs scheduling the conflicting TBs, since its corresponding PSFCH occasion may have already passed or it does not support to be UE-B.  The collision may occur between Rel-16 and Rel-17 UE’s reservation. However, the Rel-16 UE cannot support the resource collision indication even its transmission is with lower priority.  To avoid the resource collision, a more reasonable way is to take the PSFCH occasion timing and capability to receive conflict indication into account when determining UE-B. |
| Spreadtrum | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Qualcomm, LGE, Fujitsu, Panasonic, DCM, Spreadtrum, OPPO, Huawei, Spreadtrum, CATT,
* No: Futurewei, Samsung, Apple,
  + Do not change the WA: Samsung,
  + If PSFCH occasion is derived by a slot where UE-B’s scheduling SCI is transmitted, a UE which sends scheduling SCI in a later slot is UE-B: Apple,
  1. **Others**

**FL’s observation:**

According to RAN2 LS R1-2200880, RAN2 already agreed that “**Inter-UE coordination (IUC) issues (on which) RAN2 mainly relies on RAN1: Whether UE-A can be in mode1 or mode2 (interested companies are invited to raise/discuss the issue directly in RAN1)**”. FL understands that RAN1 needs to make a decision on this issue.

Q15: Do you agree the following conclusion for the type of resource allocation performed by UE-A?

Draft 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

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes |  |
| Futurewei | Yes |  |
| Samsung | Yes |  |
| InterDigital | Yes | We think it is indeed beneficial to consider the scenario where UE-A in Mode 1 provides NW-allocated resources to UE-B. However, it will likely require another lengthy round of discussions on related UE-A behavior, e.g., about acquiring the resources (e.g. BSR information and timeline). It makes sense to limit R17 IUC to Mode 2 UE-A only and leave Mode 1 UE-A for future considerations. |
| Qualcomm | Yes |  |
| Apple | Yes | As long as resource pool is not shared between mode 1 and mode 2, UE-A can only be mode 2 UE. |
| LGE | Yes | According to agreements, UE-A needs to perform sensing and resource allocation procedure for determining the set of resources. We do not need to introduce new type of UE further. |
| Fujitsu | Yes |  |
| Panasonic | Yes |  |
| ZTE | Yes |  |
| NEC | Yes |  |
| Vivo | Yes |  |
| NTT DOCOMO | Yes |  |
| Fraunhofer | No | UE-A operating in Mode 1 should be able to assist another UE-B that is operating in Mode 2. We understand that UE-B should be in Mode 2, but do not see why UE-A cannot provide IUC messages to UE-B while operating in Mode 1. |
| Ericsson | Yes |  |
| OPPO | Yes |  |
| Nokia, NSB | Yes |  |
| Huawei, HiSilicon | Yes | It is not in scope of the WID to discuss mode 1 at all for IUC. |
| xiaomi | Yes |  |
| CATT, GOHIGH | Yes |  |

**FL’s observation of 1st email discussion:**

* Yes: Intel, Futurewei, Samsung, InterDigital, Qualcomm, Apple, LGE, Fujitsu, Panasonic, ZTE, NEC, vivo, DCM, Ericsson, OPPO, Nokia, Huawei, xiaomi, CATT,
* No: Fraunhofer,

**FL’s observation:**

According to following conclusion in AI 5, FL understands that RAN1 needs to make a decision on whether/how to send reply LS of R1-2200880 to RAN2.

|  |
| --- |
| **Incoming LSs on Rel-17 NR\_SL\_enh**  [R1-2200880](file:///C:\Users\Docs\R1-2200880.zip)           LS to RAN1 on Inter-UE coordination RAN2, Intel  To be discussed as part of email discussion in [108-e-R17-Sidelink-02] under agenda item 8.11.1.2. If response to RAN2 is needed, use the same email thread to converge on a response. |

Q16: Do you agree to send a reply LS of R1-2200880 to RAN2? If yes, please specify which information needs to be conveyed on the reply LS.

|  |  |  |
| --- | --- | --- |
| Company | Yes or no | Comments |
| Intel | Yes | Latency bounds for feedback transmission should be discussed in RAN1 |
| Futurewei | Comment | If some issues to be discussed in RAN1 instead of RAN2, or vice visa, we may need a reply. For latency bound, it is not clear whether timer design in RAN2 serves the same purpose of specifying a deadline in RAN1. If the same, we prefer discussing it in RAN1 |
| Samsung |  | In fact, RAN2 did not request specific RAN1 action.  However, We can reply with agreements for which RAN2 relies on RAN1. |
| Qualcomm | No |  |
| Apple | Yes | We prefer to inform RAN2 about RAN1’s agreements/conclusions on the issues which RAN2 relies on RAN1. |
| LGE | No | Even without sending LS to RAN2, RAN2 can proceed their work considering RAN1’s progress. Note that there is no explicit request on the necessity of reply LS from RAN2. |
| Fujitsu | No |  |
| ZTE | Yes | At least RAN1’s conclusion on UE-A’s resource allocation type should be conveyed. |
| NTT DOCOMO | No |  |
| Ericsson |  | We do not see the need to send a reply to RAN2 right now. If there is any relevant agreement related to SL-DRX topic we can consider sending a reply to RAN2. |
| OPPO | Comments | Fine to reply the LS is something inconsistent with RAN2’s plan was identified in RAN1, otherwise, reply is not needed. |
| Nokia, NSB | Depends | So far we haven’t identified any problem with RAN2’s statements in the LS that requires a response. Some agreements from this meeting need to be notified to RAN2, a reply LS or a new LS can be used for that. |
| Huawei, HiSilicon | No | RAN2 does not ask RAN1 action for feedback at this stage.  There is no need for sending LS with a list of agreements without clear RAN2 action. Such LS is time consuming and does not bring any benefits because RAN2 can always take RAN1 agreements into account for their future work, and RAN1 delegates can inform their own RAN2 delegates if necessary. |
| CATT, GOHIGH | Yes | We prefer to inform RAN2 about RAN1’s agreements on the issues relied on RAN1. |

**FL’s observation of 1st email discussion:**

* Yes: Intel, Futurewei, Samsung, Apple, ZTE, CATT,
  + Latency bound issue is discussed in RAN1: Intel, Futurewei,
  + Agreements for which RAN2 relies on RAN1: Samsung, Apple, ZTE, CATT,
* No: Qualcomm, LGE, Fujitsu, DCM, Ericsson, OPPO, Huawei,

Q17: If there are any missing essential issues other than those covered in this document in supporting the inter-UE coordination feature in Rel-17, please specify it.

|  |  |
| --- | --- |
| Company | Comments |
| Intel | Procedure for filtering inter-UE coordination feedback from the same or different UEs and preparation of resource sets for resource selection, feedback aging conditions  Issue of over-exclusion of resources due to non-preferred resource sets |
| Futurewei | For scheme 2, the follow issue is not included in the discussions in this document   * 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 |
| Samsung | When IUC message or IUC request is multiplexed with data and SCI Format 2-C is used. UE-A receives a NACK, what is the expected UE-A behavior for the re-transmission of SCI Format 2-C  When UE-A receives a NACK, this is an indication that the IUC message or IUC request has been received on SCI Format 2-C. Therefore, there is no need to re-transmit IUC message or IUC request on format 2-C, Format 2-A can be used for the re-transmission. |
| Qualcomm | We have two additional comments:   1. Introduce a (pre)configuration parameter to independently enable/disable preferred and non-preferred resource set. 2. Define the conditions under which Options A and B are used for the preferred resource set. |
| Apple | We may further examine the prioritization rule among PSFCH for IUC, PSFCH for HARQ and LTE sidelink (or uplink transmissions).  There exists a possibility of circular prioritization between each pair of the above sidelink transmission or reception. For example, PSFCH for IUC is prioritized over LTE sidelink based on their priority values; LTE sidelink is prioritized over PSFCH for HARQ based on their priority values; PSFCH for HARQ is prioritized over PSFCH IUC. How do we handle this case? |
| vivo | For condition based non-preferred resource, for condition 1-B-2, reserved resource associated with unicast/groupcast transmission can be non-preferred resource. |
| NTT DOCOMO | 1. Define the conditions under which Options A and B are used for the preferred resource set. 2. Clarification of “the next reserved resource” in the agreement at the last meeting. |
| Ericsson | It is important to consider the operation of SL-DRX/power saving and IUC since RAN2 has deprioritize the issue. In our view, RAN1 should include the restrictions to the IUC mechanism to address the power saving operation. |
| Nokia, NSB | Over-exclusion at UE-B: Under high load, and especially if the number of subchannels for UE-B’s transmission is large, there may be very few remaining resources after exclusion of candidate resources overlapping with non-preferred resources, potentially giving rise to an infinite loop in the resource (re-)selection procedure. To avoid a potential infinite loop in the resource (re-)selection procedure, it is necessary to address the case where the number of remaining candidate single-slot resources after UE-B’s resource exclusion is too small. |
| CATT, GOHIGH | UE-B resource selection restriction on inter-UE scheme 2. In order to guarantee that PSFCH transmission occasion is existed between any two consecutive transmission resource, and make the scheme 2 work effectively, the duration between any two consecutive transmissions should be larger than the minimum gap. |

**FL’s observation of 1st email discussion:**

* Whether/how to support procedure for filtering inter-UE coordination information from the same or different UEs
  + Intel
* Over-exclusion of resources due to non-preferred resource set
  + Intel, Nokia,
* 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
  + Futurewei
* Which 2nd SCI format can be used for retransmission of inter-UE coordination information scheduled by a SCI format 2-C
  + Samsung
* Introduce a (pre)configuration parameter to independently enable/disable preferred and non-preferred resource set
  + Qualcomm
* Define the conditions under which Options A and B are used for the preferred resource set
  + Qualcomm, DCM
* Clarification on executing order of prioritizations among PSFCH for a conflict indication, PSFCH for HARQ-ACK information, and LTE sidelink
  + Apple
* For condition based non-preferred resource, for condition 1-B-2, reserved resource associated with unicast/groupcast transmission can be non-preferred resource
  + vivo
* Clarification of “the next reserved resource” in the agreement at the last meeting
  + DCM,
* RAN1 should include the restrictions to the IUC mechanism to address the power saving operation
  + Ericsson
* Modification on Mode 2 RA to ensure processing time budget for a conflict indication
  + CATT

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]

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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*