**3GPP TSG RAN WG1 Meeting #110 R1-220xxxx**

**Toulouse, France, August 22nd – 26th, 2022**

**Agenda item:** 8.11

**Source:** Moderator (LG Electronics)

**Title:** Initial summary for Inter-UE coordination for Mode 2 enhancements

**Document for:** Discussion and information

## Introduction

The inter-UE coordination issues in contributions [1-21] submitted to RAN1#110 meeting are summarized in the table of Sections 3. Also an initial assessment on each issue is provided based on the following classification:

* ***High priority (H)****:*
	+ *High-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes*
* ***Non-essential (N)****:*
	+ *All other purposes such as spec optimization and low priority issues*
* ***Editorial (E)****:*
	+ *Editorial issues that will be handled as editorial CRs (to be communicated to the editors/chairs)*

## Preparation for maintenance

### Collection of issues for Inter-UE coordination for Mode 2 enhancements

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| --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** |
| 1 | **[Scheme 1]** Addition of clarification for the relationship between start/end slots of resource selection window used for SL transmission carrying IUC information and start/end slots of resource selection window for determining the set of resources | [2], [3], [5], [6], [7] | H |
| 2 | **[Scheme 1]** Addition of clarification in the specification that UE-A is the destination UE of a TB transmitted by UE-B for the case when IUC information is triggered by an explicit request from UE-B and UE-A determines the set of non-preferred resources for UE-B | [2] | H |
| 3 | **[Scheme 1]** Further clarification on the resource pool used for determining the set of resources and transmitting IUC information | [4], [15] | H |
| 4 | **[Scheme 1]** Further clarification on how to deal with the different IUC information decoded by SCI format 2-C and MAC CE | [4] | N |
| 5 | **[Scheme 1]** Further clarification on conditions under which Option B can be used for the received preferred resource set | [4], [19] | N |
| 6 | **[Scheme 1]** Further clarification on obtaining the set of resources based on the received resource combination indication | [7] | N |
| 7 | **[Scheme 1]** Modification to UE-B’s behavior of excluding the non-preferred resource set from candidate single-slot resources | [7] | N |
| 8 | **[Scheme 1]** Further clarification on UE-B’s behavior of performing the random resource selection with the received non-preferred resource set* Note that how to handle this issue in RAN2 LS of R1-2205728 will be dependent on the outcome of online discussion for AI 5
 | [7], [11], [13], [21] | H |
| 9 | **[Scheme 1]** Further clarification on UE-A's behavior when it decodes one container (e.g., SCI format 2C) successfully but fails to decode the other container (e.g., MAC CE) | [8] | N |
| 10 | **[Scheme 1]** Further clarification on UE’s behavior related to RRC parameters of sl-TriggerConditionRequest and sl-Condition1-A-2* Note that how to handle this issue in RAN2 LS of R1-2205727 will be dependent on the outcome of online discussion for AI 5
 | [10] | H |
| 11 | **[Scheme 1]** Further clarification on UE's behavior regarding the transmissions of explicit request and IUC information based on the latency bound (e.g., conditions under which UE-B is allowed to transmit new explicit request, whether to allow condition-based IUC information transmission within this latency bound) | [12] | N |
| 12 | **[Scheme 1]** Introduction of additional conditions that UE-B uses the received non-preferred resource set for its resource selection | [12] | N |
| 13 | **[Scheme 1]** Addition of clarification on missing field descriptions and functions of SCI format 2-C | [12], [20] | H |
| 14 | **[Scheme 1]** Further clarification on how IUC information related fields in SCI format 2-C indicates each unit/tuple | [12] | N |
| 15 | **[Scheme 1]** Addition of clarification for cast type(s) of Scheme 1 and/or SCI format 2-C to the specification | [13], [19] | H |
| 16 | **[Scheme 1]** Further clarification on how UE-A determines the set of preferred resources when the time gap from IUC transmission to the preferred resources is larger than ($T\_{proc,0}^{SL}+T\_{proc,1}^{SL}+T\_{proc,2}^{SL}$) | [15] | N |
| 17 | **[Scheme 1]** Introduction of procedure that allows UE-B to distinguish between non-preferred resource generated based on different conditions (i.e., Condition 1-B-1, Condition 1-B-2) | [17] | N |
| 18 | **[Scheme 1]** Introduction of field of priority value in MAC CE carrying IUC information with the preferred resource set | [18] | N |
| 19 | **[Scheme 1]** Further clarification on the use of preferred resource set in the resource reselection due to re-evaluation/pre-emption/conflict information | [19] | H |
| 20 | **[Scheme 1]** Correction for the reference of the priority field of SCI format 2-C | [20] | N |
| 21 | **[Scheme 2]** Further clarification on conditions for UE to be UE-B when at least one of UEs scheduling conflicting TBs does not set indicationUEB flag to 1 | [1], [5], [14], [16], [18], [19] | H |
| 22 | **[Scheme 2]** Further clarification on the description of “valid PSFCH occasion” in the current specification | [2], [21] | N |
| 23 | **[Scheme 2]** Addition of clarification in the specification about the RSRP threshold(s) used for determining the expected/potential conflict(s) in Option 1 and/or Option 4. | [4], [9], [18], [19] | H |
| 24 | **[Scheme 2]** Further clarification on conditions for UE to be UE-B in Condition 2-A-2 | [5] | H |
| 25 | **[Scheme 2]** Further clarification on how to determine the priority for the resource conflict indication with Condition 2-A-2 | [12], [18] | N |
| 26 | **[Scheme 2]** Further clarification on PSFCH occasion indication in terms of determines a number of PSFCH resources available for multiplexing conflict information in a PSFCH transmission | [12] | N |
| 27 | **[Scheme 2]** Further clarification on PSFCH occasion validity of UEs scheduling the conflicting TBs in order for UE-A to determine whether to transmit the conflict indication | [19] | N |
| 28 | **[Scheme 2]** Further clarification on UE-A’s behavior of transmitting PSFCH for the conflict indication when multiple reserved resources are indicated by UE-B’s SCI under the situation where the PSFCH occasion is derived by a slot where UE-B’s SCI is transmitted | [19] | N |
| 29 | **[Scheme 2]** Further clarification on determining UE-B when sl-TypeUE-A is enabled or not enabled | [20] | N |
| 30 | **[Scheme 2]** Further clarification on PSFCH prioritization related to the conflict indication | [20] | N |
| 31 | **[Scheme 2]** Further clarification on priority definition for Tx and Rx of PSFCH with conflict information | [21] | N |
| 32 | **[Scheme 2]** Further clarification on Rx UE behavior if the timeline for conflict indication is not fulfilled | [21] | N |
| 33 | **[Scheme 1/2]** Correction on RRC parameter name and value misalignment | [9], [15], [19], [20] | H |

### Summary of companies’ inputs on the maintenance issues to be treated

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| **Issue#** | **FL initial assessment** | **Companies’ inputs** |
| 1 | H | * H : 13
* N : 1
* E:
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| 2 | H | * H : 7
* N : 7
* E:
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| 3 | H | * H : 10
* N : 1
* E: 1
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| 4 | N | * H : 1
* N : 13
* E:
 |
| 5 | N | * H : 1
* N : 13
* E:
 |
| 6 | N | * H :
* N : 14
* E:
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| 7 | N | * H :
* N : 13
* E: 1
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| 8 | H | * H : 12
* N : 1
* E:
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| 9 | N | * H : 2
* N : 12
* E:
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| 10 | H | * H : 13
* N :
* E:
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| 11 | N | * H : 1
* N : 13
* E:
 |
| 12 | N | * H : 1
* N : 13
* E:
 |
| 13 | H | * H : 13
* N :
* E:
 |
| 14 | N | * H : 1
* N : 13
* E:
 |
| 15 | H | * H : 12
* N : 2
* E:
 |
| 16 | N | * H : 1
* N : 13
* E:
 |
| 17 | N | * H : 2
* N :12
* E:
 |
| 18 | N | * H :
* N : 14
* E:
 |
| 19 | H | * H : 9
* N : 4
* E:
 |
| 20 | N | * H :
* N : 12
* E: 2
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| 21 | H | * H : 10
* N : 4
* E:
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| 22 | N | * H : 4
* N : 10
* E:
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| 23 | H | * H : 14
* N :
* E:
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| 24 | H | * H : 13
* N : 1
* E:
 |
| 25 | N | * H : 2
* N : 12
* E:
 |
| 26 | N | * H : 1
* N : 13
* E:
 |
| 27 | N | * H : 1
* N : 13
* E:
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| 28 | N | * H : 1
* N : 13
* E:
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| 29 | N | * H :
* N : 14
* E:
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| 30 | N | * H :
* N : 14
* E:
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| 31 | N | * H : 2
* N : 12
* E:
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| 32 | N | * H : 1
* N : 12
* E: 1
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| 33 | H | * H : 8
* N :
* E: 5
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### FL's recommendation

Based on the summary in Section 2.2, the following maintenance issues of Inter-UE coordination for Mode 2 enhancements are recommended to be addressed in this meeting. According to the decisions made in AI 5, Issue 8 and 10 for Scheme 1 and Issue 23 for Scheme 2 will be dealt with as separate email discussions. Also Issue 3 for Scheme 1 is already covered in the email discussion of [AT119-e][510][V2X/SL] in RAN2.

* Recommendation of maintenance issues for “Inter-UE coordination for Mode 2 enhancements” to be addressed in RAN1#110 meeting
	+ Scheme 1
		- [H] Issue 1
		- [H] Issue 3
		- [H] Issue 8
		- [H] Issue 10
		- [H] Issue 13
		- [H] Issue 15
		- [H] Issue 19
	+ Scheme 2
		- [H] Issue 21
		- [H] Issue 23
		- [H] Issue 24
	+ Scheme 1 and 2
		- [H] Issue 33

## Discussion

### Scheme 1

#### Issue#1: Addition of clarification for the relationship between start/end slots of resource selection window used for SL transmission carrying IUC information and start/end slots of resource selection window for determining the set of resources

##### Background

Four contributions [2][3][5][6][7] submitted in RAN1#110 meeting proposed that it is necessary to capture the following RAN1 agreement in the specification.

* *Agreement:*
	+ *X1, X2, and X3 are determined by UE-A’s implementation under the constraints defined in the specification (e.g., SL-LatencyBoundIUC-Report-r17, requirement of T\_2min)*
		- *UE-B can choose to not use any resource from the preferred/non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission*
			* *For Tproc,2,*
				+ *When only MAC CE is used for inter-UE coordination information transmission, it is equal to (Tproc,0+Tproc,1)*
				+ *When MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission, it is equal to Tproc,0*

*Note: this is assuming that SCI format 2-C is received*

* + - *Whether or not to make the time gap from the resource of inter-UE coordination information transmission to preferred/non-preferred resource in the inter-UE coordination information larger than (Tproc,0+Tproc,1+Tproc,2) is up to UE-A implementation*

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| **[Huawei, R1-2205766]****Summary of change:**Specify the permitted UE behaviour subject to timing relationships between the resource selection window for determining the set of resources and the resource selection window for transmitting IUC information, for use of non-preferred resource set. **Consequence if not approved:**The permitted UE behaviors subject to timing relationships between the resource selection window for determining the set of resources and the resource selection window for transmitting IUC information is incompletely specified for non-preferred resources.***Proposal 4: For scheme 1 inter-UE coordination information, for both triggered by UE-B’s explicit request and triggered by a condition other than explicit request reception, relationship between start/end slots of resource selection window for IUC transmission and that for determining the set of resources should be captured, as per the proposed TP from Editor of TS 38.214.***We provide the Text Proposal for section 8.1.4C of TS 38.214 below.---------------------------- Start of Text Proposal for TS 38.214 -----------------------------< Unchanged parts are omitted >8.1.4C UE procedure for using a received non-preferred resource set A UE configured with the higher layer parameter *interUECoordinationScheme1* uses a received non-preferred resource set as follows when performing resource (re-)selection:- the UE excludes in Step 6b) of clause 8.1.4 resource(s) overlapping with the non-preferred resource set.Note: If it is not possible to meet the requirement that the number of candidate single-slot resources remaining in the set $S\_{A}$ be at least $X⋅M\_{total}$ after excluding resource(s) overlapping with the received non-preferred resource set, it is up to UE implementation whether or not to take into account the received non-preferred resource set to meet such requirement.Note 2: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than $\left(T\_{proc,0}+T\_{proc, 1}+T\_{proc, 2}\right)$ after the resource of inter-UE coordination information transmission, where $T\_{proc, 2}$ is equal to $\left(T\_{proc,0}+T\_{proc, 1}\right)$ when only MAC CE is used for inter-UE coordination information transmission, or $T\_{proc, 2} $is equal to $T\_{proc,0}$ when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission assuming SCI format 2-C is received.< Unchanged parts are omitted >--------------------------------------- End of Text Proposal ----------------------------------**[LG Electronics, R1-2205848]*****Proposal: Adopt the following text proposal to TS 38.214 v17.2.0:**** ***Reason for change:***
* ***The RAN1 agreement related to UE-B's behaviour of determining a resource used for its resource (re-)selection among the non-preferred resource set received from UE-A is not captured in the specification.***
* ***Summary of change:***
* ***The relevant UE-B's behaviour is described in Section 8.1.4C of TS 38.214.***
* ***Consequences if not approved:***
* ***The specification text is unclear as to which resource UE-B uses for its resource (re-)selection among the non-preferred resource set received from UE-A***

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| --------------------------- Start of text proposal to TS 38.214 v17.2.0 ---------------------------8.1.4C UE procedure for using a received non-preferred resource set A UE configured with the higher layer parameter *interUECoordinationScheme1* uses a received non-preferred resource set as follows when performing resource (re-)selection:- the UE excludes in Step 6b) of clause 8.1.4 resource(s) overlapping with the non-preferred resource set.Note: If it is not possible to meet the requirement that the number of candidate single-slot resources remaining in the set $S\_{A}$ be at least $X⋅M\_{total}$ after excluding resource(s) overlapping with the received non-preferred resource set, it is up to UE implementation whether or not to take into account the received non-preferred resource set to meet such requirement.Note: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission, where Tproc,2 is equal to (Tproc,0+Tproc,1) when only MAC CE is used for inter-UE coordination information transmission, or Tproc,2 is equal to Tproc,0 when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission and SCI format 2-C is received.--------------------------- End of Text proposal to TS 38.214 v17.2.0 --------------------------- |

**[ZTE, R1-2206096]*****Proposal 5: Adopt the following TP to implement the agreement on the use of resource in a non-preferred resource set***8.1.4C UE procedure for using a received non-preferred resource set A UE configured with the higher layer parameter *interUECoordinationScheme1* uses a received non-preferred resource set as follows when performing resource (re-)selection:- the UE excludes in Step 6b) of clause 8.1.4 resource(s) overlapping with the non-preferred resource set.Note: If it is not possible to meet the requirement that the number of candidate single-slot resources remaining in the set $S\_{A}$ be at least $X⋅M\_{total}$ after excluding resource(s) overlapping with the received non-preferred resource set, it is up to UE implementation whether or not to take into account the received non-preferred resource set to meet such requirement.Note2: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission, where Tproc,2 is equal to (Tproc,0+Tproc,1) when only MAC CE is used for inter-UE coordination information transmission, or Tproc,2 is equal to Tproc,0 when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission assuming SCI format 2-C is received.**[OPPO, R1-2206283]****-------------------------------- Start of Text Proposal for TS 38.214 ---------------------------------****8.1.4C UE procedure for using a received non-preferred resource set** **<Unchanged parts omitted>**Note2: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission, where Tproc,2 is equal to (Tproc,0+Tproc,1) when only MAC CE is used for inter-UE coordination information transmission, or Tproc,2 is equal to Tproc,0 when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission ~~assuming~~ and SCI format 2-C is received.**--------------------------------------------End of Text Proposal -----------------------------------------*****Proposal 8: Endorse one of the TPs in Section 3 for the agreement of last meeting on upper/lower bounds of start/end slot of resource selection window used for sidelink transmission carrying inter-UE coordination information.******Proposal 9: Send an LS to RAN2 to capture the preferred resource set part of the agreement after the CR for 38.214 is decided.*****[CATT, R1-2206360]*** **TP#5**

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| ***Reason for change:*** | Corrections on NR Sidelink enhancements |
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| ***Summary of change:*** | In clause 8.1.4C, capture the agreement regarding the criterion of using non-preferred resource set achieved in RAN1#109-e. |
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| ***Consequences if not approved:*** | Do not capture RAN1 previous agreements |

---------------------------------------------- Start of text proposal to TS 38.214 v17.2.0----------------------------------------------**8.1.4C UE procedure for using a received non-preferred resource set****<<< UNCHANGED PARTS OMITTED >>>**Note: If it is not possible to meet the requirement that the number of candidate single-slot resources remaining in the set $S\_{A}$ be at least $X⋅M\_{total}$ after excluding resource(s) overlapping with the received non-preferred resource set, it is up to UE implementation whether or not to take into account the received non-preferred resource set to meet such requirement.Note2: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission, where Tproc,2 is equal to (Tproc,0+Tproc,1) when only MAC CE is used for inter-UE coordination information transmission, or Tproc,2 is equal to Tproc,0 when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission assuming SCI format 2-C is received.**<<< UNCHANGED PARTS OMITTED >>>**----------------------------------------------- End of Text proposal to TS 38.214 v17.2.0---------------------------------------------- |

##### Draft Proposals

***Draft Proposal 1:***

* ***Reason for change:***
* ***The RAN1 agreement related to UE-B's behaviour of determining a resource used for its resource (re-)selection among the non-preferred resource set received from UE-A is not captured in the specification.***
* ***Summary of change:***
* ***The relevant UE-B's behaviour is described in Section 8.1.4C of TS 38.214.***
* ***Consequences if not approved:***
* ***The specification text is unclear as to which resource UE-B uses for its resource (re-)selection among the non-preferred resource set received from UE-A***

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| --------------------------- Start of text proposal to TS 38.214 v17.2.0 ---------------------------8.1.4C UE procedure for using a received non-preferred resource set A UE configured with the higher layer parameter *interUECoordinationScheme1* uses a received non-preferred resource set as follows when performing resource (re-)selection:- the UE excludes in Step 6b) of clause 8.1.4 resource(s) overlapping with the non-preferred resource set.Note: If it is not possible to meet the requirement that the number of candidate single-slot resources remaining in the set $S\_{A}$ be at least $X⋅M\_{total}$ after excluding resource(s) overlapping with the received non-preferred resource set, it is up to UE implementation whether or not to take into account the received non-preferred resource set to meet such requirement.Note: The UE is not required to use any resource from the non-preferred resource set in its resource (re-)selection if that resource is earlier than (Tproc,0+Tproc,1+Tproc,2) after the resource of inter-UE coordination information transmission, where Tproc,2 is equal to (Tproc,0+Tproc,1) when only MAC CE is used for inter-UE coordination information transmission, or Tproc,2 is equal to Tproc,0 when MAC CE and SCI format 2-C are both used for inter-UE coordination information transmission and SCI format 2-C is received.--------------------------- End of Text proposal to TS 38.214 v17.2.0 --------------------------- |

#### Issue#13: Addition of clarification on missing field descriptions and functions of SCI format 2-C

##### Background

Two contributions [12] [20] submitted in RAN1#110 meeting proposed that it is necessary to have an addition of clarification on missing field descriptions and functions of SCI format 2-C.

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| **[vivo, R1-2206763]**The SCI format 2-C includes all the fields present in SCI format 2-A except cast type indicator, thus similar behaviors of SCI 2-A should also be applied to SCI 2-C. However, in current spec, SCI format 2-C is missing when describe the related fields or functions of SCI. Hence, the following TP for TS 38.214 is proposed.* TP#7 for TS 38.214

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| 8.1.3 Modulation order, target code rate, redundancy version and transport block size determinationThe redundancy version is given by the "Redundancy version" field in SCI format 2-A, ~~or~~ 2-B or SCI format 2-C.===omitted===8.2.1 CSI-RS transmission procedureA UE transmits sidelink CSI-RS within a unicast PSSCH transmission if the following conditions hold:- CSI reporting is enabled by higher layer parameter *sl-CSI-Acquisition*; and- the '*CSI request*' field in the corresponding SCI format 2-A or SCI format 2-C is set to 1.===omitted===8.3 UE procedure for receiving the physical sidelink shared channelFor sidelink resource allocation mode 1, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A,  ~~and~~ 2-B and 2-C, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.For sidelink resource allocation mode 2, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A,  ~~and~~ 2-B and 2-C, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.A UE is required to decode neither the corresponding SCI formats 2-A,  ~~and~~ 2-B and 2-C nor the PSSCH associated with an SCI format 1-A if the SCI format 1-A indicates an MCS table that the UE does not support.===omitted===8.5.1.2 Triggering of sidelink CSI reportsThe CSI-triggering UE is not allowed to trigger another aperiodic CSI report for the same UE before the last slot of the expected reception or completion of the ongoing aperiodic CSI report associated with the SCI format 2-A or SCI format 2-C with the '*CSI request*' field set to 1, where the last slot of the expected reception of the ongoing aperiodic CSI report is given by [10, TS38.321].An aperiodic CSI report is triggered by an SCI format 2-A or SCI format 2-C with the '*CSI request*' field set to 1. ===omitted===Sidelink CSI-RS shall be transmitted according to [4, TS 38.211] in the resource blocks used for the PSSCH associated with the SCI format 2-A or SCI format 2-C triggering a report.===omitted===- The number of PSSCH and DM-RS symbols is equal to *sl-LengthSymbols*‒2.- Assume no REs allocated for sidelink CSI-RS.- Assume no REs allocated SCI format 2-A, ~~or~~ SCI format 2-B, or SCI format 2-C .===omitted=== |

***Proposal 16: Adopt the TP#7 for 38.214.*****[ASUSTeK, R1-2207483]****2.1 Missing SCI format 2C in TS38.214**

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| ***Reason for change:*** | In the current 38.214, SCI format 2-C is missing in clauses of RV, PSSCH reception and SL CSI. |
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| ***Summary of change:*** | SCI format 2-C is added in corresponding clauses of RV, PSSCH reception and SL CSI. |
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| ***Consequences if not approved:*** | SCI format 2-C cannot support functions of RV, PSSCH reception and SL CSI. |
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| ***Clauses affected:*** | 8.1.3, 8.2.1, 8.3, 8.5.1.2, 8.5.2.2, 8.5.2.3 in TS 38.214. |
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**---------------------------------------< Text Proposal 1 for 38.214> --------------------------------------**8.1.3 Modulation order, target code rate, redundancy version and transport block size determinationThe redundancy version is given by the "Redundancy version" field in SCI format 2-A, 2-B or 2-C.…8.2 UE procedure for transmitting sidelink reference signals8.2.1 CSI-RS transmission procedureA UE transmits sidelink CSI-RS within a unicast PSSCH transmission if the following conditions hold:- CSI reporting is enabled by higher layer parameter *sl-CSI-Acquisition*; and- the '*CSI request*' field in the corresponding SCI format 2-A or 2-C is set to 1.…8.3 UE procedure for receiving the physical sidelink shared channelFor sidelink resource allocation mode 1, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B or 2-C, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.For sidelink resource allocation mode 2, a UE upon detection of SCI format 1-A on PSCCH can decode PSSCH according to the detected SCI formats 2-A, 2-B or 2-C, and associated PSSCH resource configuration configured by higher layers. The UE is not required to decode more than one PSCCH at each PSCCH resource candidate.A UE is required to decode neither the corresponding SCI formats 2-A, 2-B and 2-C nor the PSSCH associated with an SCI format 1-A if the SCI format 1-A indicates an MCS table that the UE does not support.…8.5.1.2 Triggering of sidelink CSI reportsThe CSI-triggering UE is not allowed to trigger another aperiodic CSI report for the same UE before the last slot of the expected reception or completion of the ongoing aperiodic CSI report associated with the SCI format 2-A or 2-C with the '*CSI request*' field set to 1, where the last slot of the expected reception of the ongoing aperiodic CSI report is given by [10, TS38.321].An aperiodic CSI report is triggered by an SCI format 2-A or 2-C with the '*CSI request*' field set to 1. A UE is not expected to transmit a sidelink CSI-RS and a sidelink PT-RS which overlap.…8.5.2.2 Reference signal (CSI-RS)The UE can be configured with one CSI-RS pattern as indicated by the higher layer parameters *sl-CSI-RS-FreqAllocation, sl-CSI-RS-FirstSymbol* in *SL-CSI-RS-Config*.Parameters for which the UE shall assume non-zero transmission power for CSI-RS are configured according to clause 8.2.1. A UE is not expected to be configured such that a CSI-RS and the corresponding PSCCH can be mapped to the same resource element. A UE is not expected to receive sidelink CSI-RS and PSSCH DM-RS, nor CSI-RS and 2nd-stage SCI, on the same symbol.Sidelink CSI-RS shall be transmitted according to [4, TS 38.211] in the resource blocks used for the PSSCH associated with the SCI format 2-A or 2-C triggering a report.8.5.2.3 CSI reference resource definitionThe CSI reference resource in sidelink is defined as follows:- In the frequency domain, the CSI reference resource is defined by the group of sidelink physical resource blocks containing the sidelink CSI-RS to which the derived CSI relates.- In the time domain, the CSI reference resource for a CSI reporting in sidelink slot *n* is defined by a single sidelink slot *nCSI\_ref* where *nCSI\_ref* is the same sidelink slot as the corresponding CSI request.If configured to report CQI index and RI index, in the CSI reference resource, the UE shall assume the following for the purpose of deriving the CQI index and RI index:- The reference resource uses the CP length and subcarrier spacing configured for the SL BWP.- Redundancy Version 0.- PSCCH occupies 2 OFDM symbols.- The number of PSSCH and DM-RS symbols is equal to *sl-LengthSymbols*‒2.- Assume no REs allocated for sidelink CSI-RS.- Assume no REs allocated SCI format 2-A, SCI format 2-B, or SCI format 2-C.- Assume the same number of DM-RS symbols as the smallest one configured by the higher layer parameter *sl-PSSCH-DMRS-TimePatternList.* - Assume no REs allocated for sidelink PT-RS.**-------------------------------------------**< End of Text Proposal 1> **---------------------------------------****Proposal 1: Adopt text proposal 1 in updating of TS 38.214.** |

##### Draft Proposals

[TBD]

#### Issue#15: Addition of clarification for cast type(s) of Scheme 1 and/or SCI format 2-C to the specification

##### Background

Two contributions [13] [19] submitted in RAN1#110 meeting proposed that it is necessary to have an addition of clarification for cast type(s) of Scheme 1 and/or SCI format 2-C to the specification

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| **[Samsung, R1-2206804]****Summary of change**Clarify in TS 38.212 that the SCI format 2-C can be used for inter-UE coordination information transmission only when the cast type is unicast.**Consequence if not approved**RAN1 agreement is not fully captured, i.e., it’s missing in specification that the SCI format 2-C can be used in addition to MAC-CE for inter-UE coordination information transmission only when the cast type is unicast.**Text proposal 1**We provide the Text Proposal for section 8.4.1.3 of TS 38.212 [2] as below.

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| ---------------------------- Start of Text Proposal for TS 38.212 -----------------------------8.4.1.3 SCI format 2-CSCI format 2-C is used for the decoding of PSSCH, and providing inter-UE coordination information for unicast or requesting inter-UE coordination information.< Unchanged parts are omitted >--------------------------------------- End of Text Proposal ---------------------------------- |

**[DOCOMO, R1-2207386]****2.2.1.1 Cast type for IUC scheme 1**

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| **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

**Conclusion**For cast type(s) of inter-UE coordination information with preferred resource set triggered by a condition other than explicit request reception, there is no consensus in RAN1 on the support of groupcast or broadcast for preferred resource set**Agreement**For inter-UE coordination information transmission, only when the cast type of inter-UE coordination information is unicast regardless of whether or not it is multiplexed with other data, a SCI format 2-C can be used in addition to MAC CE  |

* Reason for change

Regarding cast type for scheme 1, the above agreements/conclusion were reached. However, it seems that there is no corresponding text in RAN1/RAN2 spec. Basically cast type determination should be specified in RAN2 spec, thus an LS to inform these agreements should be sent to RAN2. Meanwhile SCI format 2-C is a PHY feature. Corresponding text should be added to RAN1 spec.* Summary of change

Clarify that SCI format 2-C is used only for unicast.* Consequences if not approved

UE may use SCI format 2-C for multicast/broadcast.**Text proposal 8:**

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| 38.2128.4.1.3 SCI format 2-CSCI format 2-C is used for the decoding of PSSCH, and providing inter-UE coordination information or requesting inter-UE coordination information. SCI format 2-C can be used only for unicast.The following information is transmitted by means of the SCI format 2-C:**<Unchanged parts omitted>** |

**Proposal 1:*** *Send an LS to RAN2 to inform agreements/conclusion on cast type related to IUC scheme 1 and ask to update their specification accordingly.*
 |

##### Draft Proposals

***Draft Proposal 1:***

* ***Reason for change***
* ***Regarding cast type for scheme 1, the above agreements/conclusion were reached. However, it seems that there is no corresponding text in RAN1/RAN2 spec. Basically cast type determination should be specified in RAN2 spec, thus an LS to inform these agreements should be sent to RAN2. Meanwhile SCI format 2-C is a PHY feature. Corresponding text should be added to RAN1 spec.***
* ***Summary of change***
* ***Clarify that SCI format 2-C is used only for unicast.***
* ***Consequences if not approved***
* ***UE may use SCI format 2-C for multicast/broadcast.***

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| 38.2128.4.1.3 SCI format 2-CSCI format 2-C is used for the decoding of PSSCH, and providing inter-UE coordination information or requesting inter-UE coordination information. SCI format 2-C can be used only for unicast.The following information is transmitted by means of the SCI format 2-C:**<Unchanged parts omitted>** |

***Draft Proposal 2:***

* ***Send an LS to RAN2 to inform agreements/conclusion on cast type related to IUC scheme 1 and ask to update their specification accordingly.***

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| **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

**Conclusion**For cast type(s) of inter-UE coordination information with preferred resource set triggered by a condition other than explicit request reception, there is no consensus in RAN1 on the support of groupcast or broadcast for preferred resource set**Agreement**For inter-UE coordination information transmission, only when the cast type of inter-UE coordination information is unicast regardless of whether or not it is multiplexed with other data, a SCI format 2-C can be used in addition to MAC CE  |

#### Issue#19: Further clarification on the use of preferred resource set in the resource reselection due to re-evaluation/pre-emption/conflict information

##### Background

One contribution [19] submitted in RAN1#110 meeting proposed that it is necessary to have further clarification on the use of preferred resource set in the resource reselection due to re-evaluation/pre-emption/conflict information.

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| **[DOCOMO, R1-2207386]****2.2.1.3 Preferred resources for resource reselection**

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| 38.3215.22.1.1 SL Grant reception and SCI transmission...3> if configured by RRC, sl-InterUE-CoordinationScheme1 enabling reception of preferred resource set and non-preferred resource set and when the UE does not have own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE:4> randomly select the time and frequency resources for one transmission opportunity from the resources belonging to the received preferred resource set for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.3> if configured by RRC, sl-InterUE-CoordinationScheme1 enabling reception of preferred resource set and non-preferred resource set and when the UE has own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE:4> randomly select the time and frequency resources for one transmission opportunity within the intersection of the received preferred resource set and the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.4> if there are no resources within the intersection that can be selected as the time and frequency resources for the one transmission opportunity according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.5> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.4> use the randomly selected resource to select a set of periodic resources spaced by the resource reservation interval for transmissions of PSCCH and PSSCH corresponding to the number of transmission opportunities of MAC PDUs determined in TS 38.214 [7].…5.22.1.2a Re-evaluation and Pre-emption...2> randomly select the time and frequency resource from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for either the removed resource or the dropped resource, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of either SL data available in the logical channel(s) by ensuring the minimum time gap between any two selected resources of the selected sidelink grant in case that PSFCH is configured for this pool of resources, and that a resource can be indicated by the time resource assignment of an SCI for a retransmission according to clause 8.3.1.1 of TS 38.212 [9];…2> if one or multiple SL DRX is configured:3> randomly select the time and frequency resource from the resources later than the resources for either the removed resource or the dropped resource indicated by a prior SCI, from the resource indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] which occur within the SL DRX active time as specified in clause 5.28.3 of the destination UE selected for indicating to the physical layer the SL DRX active time above, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of either SL data available in the logical channel(s) by ensuring the minimum time gap between any two selected resources of the selected sidelink grant in case that PSFCH is configured for this pool of resources, and that a resource can be indicated by the time resource assignment of an SCI for a retransmission according to clause 8.3.1.1 of TS 38.212 [9].2> else:3> randomly select the time and frequency resource from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for either the removed resource or the dropped resource, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of either SL data available in the logical channel(s) by ensuring the minimum time gap between any two selected resources of the selected sidelink grant in case that PSFCH is configured for this pool of resources, and that a resource can be indicated by the time resource assignment of an SCI for a retransmission according to clause 8.3.1.1 of TS 38.212 [9].…5.22.1.2b Re-selection for using a received resource conflict indication...2> randomly select the time and frequency resource from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] excluding the conflict resource(s) for the removed resource, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of either SL data available in the logical channel(s) by ensuring the minimum time gap between any two selected resources of the selected sidelink grant in case that PSFCH is configured for this pool of resources, and that a resource can be indicated by the time resource assignment of an SCI for a retransmission according to clause 8.3.1.1 of TS 38.212 [9]; |

In the current specification, non-preferred resources are excluded from S\_A at PHY layer and preferred resources are preferentially selected in selection procedure from S\_A at MAC layer. Once we see MAC spec carefully, it can be found that preferred resources are used in resource selection procedure but not in resource reselection procedure due to re-evaluation/pre-emption/conflict information.However, ‘resource (re)selection’ in RAN1 agreements include the resource reselection procedure due to re-evaluation/pre-emption/conflict information. MAC spec should be updated such that preferred resources, if available, are used when resource reselection is performed due to re-evaluation/pre-emption/conflict information. One note is that non-preferred resource is used also for this purpose in PHY layer. There would be no reason to skip using preferred resources.**Proposal 3:*** *Send an LS to ask RAN2 to use preferred resources for resource reselection due to re-evaluation/pre-emption/conflict information, if available.*
 |

##### Draft Proposals

***Draft Proposal 1:***

* ***Send an LS to ask RAN2 to use preferred resources for resource reselection due to re-evaluation/pre-emption/conflict information, if available.***

### Scheme 2

#### Issue#21: Further clarification on conditions for UE to be UE-B when at least one of UEs scheduling conflicting TBs does not set indicationUEB flag to 1

##### Background

#### Issue#24: Further clarification on conditions for UE to be UE-B in Condition 2-A-2

##### Background

### Scheme 1 and 2

#### Issue#33: Correction on RRC parameter name and value misalignment

##### Background

## Proposals for discussion in online sessions

TBD

## Reference

1. R1-2205742 Correction for inter-UE coordination Scheme 2 determination of UE-B FUTUREWEI
2. R1-2205766 Remaining issues on maintenance of Rel-17 sidelink enhancements Huawei, HiSilicon
3. R1-2205848 Discussion on maintenance on NR sidelink enhancement LG Electronics
4. R1-2205977 Remaining issues on NR Sidelink enhancement Spreadtrum Communications
5. R1-2206096 Maintenance on NR SL enhancement ZTE, Sanechips
6. R1-2206283 Remaining essential issues in R17 NR sidelink enhancement OPPO
7. R1-2206360 Maintenance on NR sidelink enhancement CATT, GOHIGH
8. R1-2206447 Remaining issues on resource allocation for sidelink enhancement Lenovo
9. R1-2206468 Editorial correction for inter-UE coordination NEC
10. R1-2206562 Discussion on LS Related to RRC Parameters for IUC Scheme 1 and Default CBR Configuration Intel Corporation
11. R1-2206563 Discussion on LS on IUC with Non-Preferred Resource Set Intel Corporation
12. R1-2206763 Maintenance on NR Sidelink enhancement vivo
13. R1-2206804 Maintenance on NR sidelink enhancement Samsung
14. R1-2206890 Maintenance on NR Sidelink enhancement CMCC
15. R1-2206936 Remaining issues on NR sidelink enhancement Sharp
16. R1-2207146 Remaining issues on R17 SL Enhancement InterDigital, Inc.
17. R1-2207206 Remaining issues in Sidelink Qualcomm Incorporated
18. R1-2207313 On Maintenance of NR Sidelink Enhancement Apple
19. R1-2207386 Maintenance of sidelink enhancement NTT DOCOMO, INC.
20. R1-2207483 Maintenance on Inter-UE coordination ASUSTeK
21. R1-2207563 Critical corrections and remaining issues on NR SL enhancement Ericsson