**3GPP TSG-3 Meeting # *R3-212732***

**17th - 28th May 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23** | **CR** |  | **rev** | 1 | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:*** | Addition of sidelink MR-DC resource coordination | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, LG Electronics, LGU+, Deutsche Telekom, CATT, NTT Docomo, InterDigital, Intel Corporation | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16, 5G\_V2X\_NRSL | | | | |  | ***Date:*** | | | 07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | 6 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In MR-DC, resources being interfered by other concurrent transmission in neighboring cells is a general issue that is addressed today by the means of the *MR-DC Resource Coordination Information* IE present in Dual Connectivity procedures.  When V2X comes into scope, nodes other than the MN cannot know of the bandwidth used for the sidelink resource configuration. This can cause resource collision when e.g. the SN’s served UEs through SRB3 are on the same bandwidth as the MN’s sidelink (SL) allocated resources.  To address this issue and complement the Rel-15 MR-DC resource coordination for Uu, SL resource configuration must be allowed to be communicated from the MN to the SNs, so that MR-DC communication will not be impacted during SL transmission. | | | | | | | | |
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| ***Summary of change:*** | | This CR proposes to enable the legacy *MR-DC Resource Coordination Information* IE to be used for allowing coordination of sidelink resource utilisation between MR-DC nodes.  Impact analysis:  This CR has isolated impact towards the previous version of the specification (same release) because it is addition of new optional IEs.  The impact can be considered isolated because it does not put any new requirements on the network or the UE. | | | | | | | | |
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| ***Consequences if not approved:*** | | If the MN does not inform the SN on the need of resource coordination with its SL resource configuration, resource collision can happen for the SN’s served Uu UEs through SRB3 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.3.1.2, 8.3.3.2, 8.3.4.2, 9.2.2.33, 9.2.2.34, 9.2.2.35, 9.2.2.36, 9.2.2.37, TBD | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: revision during RAN3#112e discusion | | | | | | | | |

**START OF CHANGES**

8.3.1.2 Successful Operation

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**Figure 8.3.1.2-1: S-NG-RAN node Addition Preparation, successful operation**

The M-NG-RAN node initiates the procedure by sending the S-NODE ADDITION REQUEST message to the S-NG-RAN node.

***Skipped text unchanged***

If the S-NODE ADDITION REQUEST message contains the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node should forward it to lower layers and it may use it for the purpose of resource or sidelink resource coordination with the M-NG-RAN node. The S-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The S-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node shall, if supported, use the information to determine further coordination of resource or sidelink resource utilisation between the S-NG-RAN node and the M-NG-RAN node.

**NEXT CHANGE**

8.3.3.2 Successful Operation

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**Figure 8.3.3.2-1: M-NG-RAN node initiated S-NG-RAN node Modification Preparation, successful operation**

The M-NG-RAN node initiates the procedure by sending the S-NODE MODIFICATION REQUEST message to the S-NG-RAN node.

***Skipped text unchanged***

If the S-NODE MODIFICATION REQUEST message contains the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node should forward it to lower layers and it may use it for the purpose of resource or sidelink resource coordination with the M-NG-RAN node. The S-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The S-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node shall, if supported, use the information to determine further coordination of resource or sidelink resource utilisation between the S-NG-RAN node and the M-NG-RAN node.

**NEXT CHANGE**

8.3.4.2 Successful Operation

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**Figure 8.3.4.2-1: S-NG-RAN node initiated S-NG-RAN node Modification, successful operation.**

The S-NG-RAN node initiates the procedure by sending the S-NODE MODIFICATION REQUIRED message to the M-NG-RAN node.

***Skipped text unchanged***

If the S-NODE MODIFICATION CONFIRM message contains the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node should forward it to lower layers and it may use it for the purpose of resource or sidelink resource coordination with the M-NG-RAN node. The S-NG-RAN node shall consider the value of the received *UL Coordination Information* IE valid until reception of a new update of the IE for the same UE. The S-NG-RAN node shall consider the value of the received *DL Coordination Information* IE valid until reception of a new update of the IE for the same UE. If the *E-UTRA Coordination Assistance Information* IE or the *NR Coordination Assistance Information* IE is contained in the *MR-DC Resource Coordination Information* IE, the S-NG-RAN node shall, if supported, use the information to determine further coordination of resource or sidelink resource utilisation between the S-NG-RAN node and the M-NG-RAN node.

**NEXT CHANGE**

9.2.2.33 MR-DC Resource Coordination Information

The *MR-DC Resource Coordination Information* IE is used to coordinate resource or sidelink resource utilisation between the M-NG-RAN node and the S-NG-RAN node.

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| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| *CHOICE* NG-RAN Node Resource Coordination Information | M |  |  |  |
| >EUTRA |  |  |  |  |
| >>E-UTRA Resource Coordination Information |  |  | 9.2.2.34 | E-UTRA resource coordination information |
| *>*NR |  |  |  |  |
| >>NR Resource Coordination Information |  |  | 9.2.2.35 | NR resource coordination information |

9.2.2.34 E-UTRA Resource Coordination Information

The *E-UTRA Resource Configuration Information* IE indicates LTE resource allocation at ng-eNB used at the gNB to coordinate resource or sidelink resource utilisation between M-NG-RAN-node and S-NG-RAN node.

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| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** | **Criticality** | **Assigned criticality** |
| EUTRA Cell ID | M |  | E-UTRA CGI  9.2.2.8 | This IE indicates the sPCell. |  |  |
| UL Coordination Information | M |  | BIT STRING (6..4400, …) | Each position in the bitmap represents a PRB pair in a subframe; value "0" indicates "PCell resource not intended to be used for transmission by the sending node", value "1" indicates "PCell resource intended to be used for transmission by the sending node". The bit string spans from the first PRB pair of the first represented subframe to the last PRB pair of the same subframe and then moves to the following PRBs in the following subframes in the same order. Each position is applicable only in positions corresponding to UL subframes or SL subframes for sidelink transmission.  The bit string may span across multiple contiguous subframes (maximum 40).  The first position of the *UL Coordination Information* corresponds to subframe 0 in a radio frame where *SFN* = 0.  The length of the bit string is an integer multiple of , or .  and are defined in TS 36.211 [10].  The UL Coordination Information is continuously repeated. |  |  |
| DL Coordination Information | O |  | BIT STRING (6..4400, …) | Each position in the bitmap represents a PRB pair in a subframe; value "0" indicates "PCell resource not intended to be used for transmission by the sending node", value "1" indicates "PCell resource intended to be used for transmission by the sending node". The bit string spans from the first PRB pair of the first represented subframe to the last PRB pair of the same subframe and then moves to the following PRBs in the following subframes in the same order. Each position is applicable only in positions corresponding to DL subframes.  The bit string may span across multiple contiguous subframes (maximum 40). The first position of the *DL Coordination Information* corresponds to the receiving node’s subframe 0 in a receiving node’s radio frame where *SFN* = 0.  The length of the bit string is an integer multiple of .  is defined in TS 36.211 [10].  The DL Coordination Information is continuously repeated. |  |  |
| NR CGI | O |  | 9.2.2.7 | This IE indicates the assumed sPCell. |  |  |
| E-UTRA Coordination Assistance Information | O |  | 9.2.2.36 |  |  |  |
| E-UTRA V2X Coordination Assistance Information | O |  | 9.2.2.X |  | Yes | Reject |

9.2.2.35 NR Resource Coordination Information

The *NR Resource Coordination Information* IE indicates resources within the bandwidth of the ng-eNB sPCell which are not available for use by the ng-eNB and is used at the ng-eNB to coordinate resource or sidelink resource utilisation between the gNB and the ng-eNB.

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| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** | **Criticality** | **Assigned criticality** |
| NR CGI | M |  | 9.2.2.7 | This IE indicates the sPCell. |  |  |
| UL Coordination Information | M |  | BIT STRING (6..4400, …) | Each position in the bitmap represents a PRB pair in a subframe; value "0" indicates "sPCell resource not intended to be used for transmission by the sending node", value "1" indicates "sPCell resource intended to be used for transmission by the sending node". The bit string spans from the first PRB pair of the first represented subframe to the last PRB pair of the same subframe and then moves to the following PRBs in the following subframes in the same order. Each position is applicable only in positions corresponding to UL subframes or SL subframes for sidelink transmission.  The bit string may span across multiple contiguous subframes (maximum 40). The first position of the *UL Coordination Information* corresponds to the receiving node’s subframe 0 in a receiving node’s radio frame where *SFN* = 0.  The length of the bit string is an integer multiple of  or .  and are defined in TS 36.211 [26].  The UL Coordination Information is continuously repeated. |  |  |
| DL Coordination Information | O |  | BIT STRING (6..4400, …) | Each position in the bitmap represents a PRB pair in a subframe; value "0" indicates "sPCell resource not intended to be used for transmission by the sending node", value "1" indicates "sPCell resource intended to be used for transmission by the sending node". The bit string spans from the first PRB pair of the first represented subframe to the last PRB pair of the same subframe and then moves to the following PRBs in the following subframes in the same order. Each position is applicable only in positions corresponding to DL subframes.  The bit string may span across multiple contiguous subframes (maximum 40). The first position of the *DL Coordination Information* corresponds to the receiving node’s subframe 0 in a receiving node’s radio frame where *SFN* = 0.  The length of the bit string is an integer multiple of .  is defined in TS 36.211 [26].  The DL Coordination Information is continuously repeated. |  |  |
| EUTRA Cell ID | O |  | ECGI  9.2.2.8 | Reference cell for *UL Coordination Information* IE and *DL Coordination Information* IE. |  |  |
| NR Coordination Assistance Information | O |  | 9.2.2.37 |  |  |  |
| NR V2X Coordination Assistance Information | O |  | 9.2.2.Y |  | Yes | Reject |

**NEXT CHANGE**

9.2.2.X E-UTRA V2X Coordination Assistance Information

The *E-UTRA V2X Coordination Assistance Information* IE is provided by the ng-eNB and used by the gNB to determine further coordination of sidelink resource utilisation between the gNB and the ng-eNB.

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| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| E-UTRA V2X Coordination Assistance Information | M |  | ENUMERATED(Coordination Not Required, …) |  |

9.2.2.Y NR V2X Coordination Assistance Information

The *NR V2X Coordination Assistance Information* IE is provided by the gNB and used by the ng-eNB to determine further coordination of sidelink resource utilisation between the gNB and the ng-eNB.

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| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| NR V2X Coordination Assistance Information | M |  | ENUMERATED(Coordination Not Required, …) |  |

**NEXT CHANGE**

Will add asn.1 later

**END OF CHANGES**