**3GPP TSG-RAN WG3 Meeting #119bis-eR3-232074**

**Electronic meeting, 17 Apr – 26 Apr, 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.423** | **CR** | **1745** | **rev** | **2** | **Current version:** | 16.10.1 |  |
|  | | | | | | | | |
| *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:*** | Correction on E-UTRA - NR Cell Resource Coordination | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Orange, China Telecom, Deutsche Telekom, Nokia, Nokia shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2023-04-01 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | A |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Few errors are detected in E-UTRA - NR CELL RESOURCE COORDINATION procedure:   * The procedural texts used to mandate the presence of IE *List of NR Cells* is put into a wrong place*.* * In E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE message, the presence of IE *List of E-UTRA Cells* and IE *List of NR Cells* are optional which is incorrect from function point of view. The two IEs should be mandatory as they are in the E-UTRA - NR CELL RESOURCE COORDINATION REQUST message. (In ASN.1, the two IEs are implemented as mandatory, but the range starts from 0. So, it is actually optional in ASN.1) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The following changes are made to correct the errors:   * To move the procedural text for IE *List of NR Cells* to the en-gNB initiated E-UTRA – NR Cell Resource Coordination part. * To add procedural texts for IE *List of E-UTRA Cells* and IE *List of NR Cells* in E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE to make them mandatory in the spec. * To update the tabular in E-UTRA - NR CELL RESOURCE COORDINATION REQUEST and E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE message to fully align to ASN.1. * Procedural text clean-up for IE *List of E-UTRA Cells* and IE *List of NR Cells* in E-UTRA - NR CELL RESOURCE COORDINATION REQUEST message.   Impact Analysis:  Impact assessment towards the previous version of the specification (same release):  This CR has isolated impact with the previous version of the specification.  This CR has an impact under functional point of view.  The impact can be considered isolated because the change affects one stem function. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Errors exist in E-UTRA - NR CELL RESOURCE COORDINATION procedure. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.7.15.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | V1, update coverpage.  V2, update according to offline comments. Add co-source | | | | | | | | |

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Start of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

### 8.7.15 E-UTRA – NR Cell Resource Coordination

#### 8.7.15.1 General

The purpose of the E-UTRA – NR Cell Resource Coordination procedure is to enable coordination of radio resource allocation between an eNB and an en-gNB that are sharing spectrum and whose coverage areas are fully or partially overlapping. During the procedure, the eNB and en-gNB shall exchange their intended resource allocations for data traffic, and, if possible, converge to a shared resource. The procedure is only to be used for the purpose of E-UTRA – NR spectrum sharing.

The procedure uses non-UE-associated signalling.

#### 8.7.15.2 Successful Operation



Figure 8.7.15.2-1: eNB-initiated E-UTRA – NR Cell Resource Coordination request, successful operation



Figure 8.7.15.2-2: en-gNB-initiated E-UTRA – NR Cell Resource Coordination request, successful operation

If case of network sharing with multiple cell ID broadcast with shared X2-C signalling transport, as specified in TS 36.300 [15], the E-UTRA – NR CELL RESOURCES COORDINATION REQUEST message and the E-UTRA – NR CELL RESOURCES COORDINATION RESPONSE message shall contain the *Interface Instance Indication* IE to identify the corresponding interface instance.

**eNB initiated E-UTRA – NR Cell Resource Coordination:**

An eNB initiates the procedure by sending the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message to an en-gNB over the X2 interface. The en-gNB extracts the *Data Traffic Resource Indication* IE and it replies by sending the E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message. The en-gNB shall calculate the full eNB resource allocation by combining the *Data Traffic Resource Indication* IE and the *Protected E-UTRA Resource Indication* IE that were most recently received from the eNB.

In case of conflict between the most recently received *Data Traffic Resource Indication* IE and the most recently received *Protected E-UTRA Resource Indication* IE, the en-gNB shall give priority to the *Protected E-UTRA Resource Indication* IE.

Then the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message shall contain at least one *EUTRA Cell ID* in the *List of E-UTRA Cells in E-UTRA Coordination Request* IE.

The E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message shall contain at least one *NR-Cell ID* IE in the *List of NR Cells in NR Coordination Response* IE.**en-gNB initiated E-UTRA – NR Cell Resource Coordination:**

An en-gNB initiates the procedure by sending the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message to an eNB. The eNB replies with the E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message. The en-gNB shall calculate the full eNB resource allocation by combining the *Data Traffic Resource Indication* IE and the *Protected E-UTRA Resource Indication* IE that were most recently received from the eNB.

In case of conflict between the most recently received *Data Traffic Resource Indication* IE and the most recently received *Protected E-UTRA Resource Indication* IE, the en-gNB shall give priority to the *Protected E-UTRA Resource Indication* IE.

The E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message shall contain at least one *NR-Cell ID* IE in the *List of NR Cells in NR Coordination Request* IE.

The E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message shall contain at least one *EUTRA Cell ID* IEin the *List of E-UTRA Cells in E-UTRA Coordination Response* IE.

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

#### 9.1.4.24 E-UTRA – NR CELL RESOURCE COORDINATION REQUEST

Direction: eNB → en-gNB, en-gNB → eNB.

This message is sent by a neighbouring eNB to a peer en-gNB or by a neighbouring en-gNB to a peer eNB, both nodes able to interact for EN-DC, to express the desired resource allocation for data traffic, for the sake of E-UTRA - NR Cell Resource Coordination.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| CHOICE*Initiating Node Type* | M |  |  |  | - |  |
| **>***eNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.126 | Indicates resource allocations for data traffic. | YES | reject |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxCellineNB) | Indicates the E-UTRA cells involved in resource coordination with the NR cells affiliated with the same ***Spectrum Sharing Group ID****.* | YES | reject |
| **>>List of E-UTRA Cells in E-UTRA Coordination Request** |  | *1* |  | List of applicable E-UTRA cells. | YES | reject |
| **>>>List of E-UTRA Cells in E-UTRA Coordination Request Item** |  | *0 .. <maxCellineNB>* |  |  |  |  |
| >>>>EUTRA Cell ID | M |  | ECGI 9.2.14 |  | - |  |
| **>***en-gNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.126 | Indicates resource allocations for data traffic. | YES | reject |
| **>>List of E-UTRA Cells in NR Coordination Request** |  | *1* |  | List of applicable E-UTRA cells | YES | reject |
| **>>>List of E-UTRA Cells in NR Coordination Request Item** |  | *1 .. <maxCellineNB>* |  |  |  |  |
| >>>>EUTRA Cell ID | M |  | ECGI 9.2.14 |  | – |  |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxCellineNB) | Indicates the NR cells involved in resource coordination with the E-UTRA cells affiliated with the same ***Spectrum Sharing Group ID****.* | YES | reject |
| **>>List of NR Cells in NR Coordination Request** |  | *1* |  | List of applicable NR cells | YES | reject |
| **>>>List of NR Cells in NR Coordination Request Item** |  | *0 .. <* maxnoNRcellsSpectrumSharingwithE-UTRA *>* |  |  |  |  |
| >>>>NR-Cell ID | M |  | NR-CGI 9.2.105 |  | - |  |
| Interface Instance Indication | O |  | 9.2.143 |  | YES | reject |

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#### 9.1.4.25 E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE

This message is sent by a neighbouring eNB to a peer en-gNB or by a neighbouring en-gNB to a peer eNB, both nodes able to interact for EN-DC, as a response to the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST.

Direction: eNB → en-gNB, en-gNB → eNB.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.13 |  | YES | reject |
| CHOICE*Responding NodeType* | M |  |  |  | - |  |
| **>***eNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.126 | Indicates resource allocations for data traffic. | YES | reject |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxCellineNB) | Indicates the E-UTRA cells involved in resource coordination with the NR cells affiliated with the same *Spectrum Sharing Group ID.* | YES | reject |
| **>>List of E-UTRA Cells in E-UTRA Coordination Response** |  | *1* |  | List of applicable E-UTRA cells | YES | reject |
| **>>>List of E-UTRA Cells in E-UTRA Coordination Response Item** |  | *0 .. <maxCellineNB>* |  |  |  |  |
| >>>>EUTRA Cell ID | M |  | ECGI 9.2.14 |  | - |  |
| **>***en-gNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.126 | Indicates resource allocations for data traffic. | YES | reject |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxCellineNB) | Indicates the NR cells involved in resource coordination with the E-UTRA cells affiliated with the same *Spectrum Sharing Group ID.* | YES | reject |
| **>>List of NR Cells in NR Coordination Response** |  | *1* |  | List of applicable NR cells | YES | reject |
| **>>>List of NR Cells in NR Coordination Response Item** |  | *0 .. < maxnoNRcellsSpectrumSharingwithE-UTRA >* |  |  |  |  |
| >>>>NR Cell ID | M |  | NR-CGI 9.2.105 |  | - |  |
| Interface Instance Indication | O |  | 9.2.143 |  | YES | reject |

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-- E-UTRA - NR CELL RESOURCE COORDINATION REQUEST

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

EUTRANRCellResourceCoordinationRequest ::= SEQUENCE {

protocolIEs ProtocolIE-Container {{EUTRANRCellResourceCoordinationRequest-IEs}},

...

}

EUTRANRCellResourceCoordinationRequest-IEs X2AP-PROTOCOL-IES ::= {

{ ID id-InitiatingNodeType-EutranrCellResourceCoordination CRITICALITY reject TYPE InitiatingNodeType-EutranrCellResourceCoordination PRESENCE mandatory}|

{ ID id-InterfaceInstanceIndication CRITICALITY reject TYPE InterfaceInstanceIndication PRESENCE optional },

...

}

InitiatingNodeType-EutranrCellResourceCoordination ::= CHOICE {

initiate-eNB ProtocolIE-Container {{ENB-EUTRA-NRCellResourceCoordinationReqIEs}},

initiate-en-gNB ProtocolIE-Container {{En-gNB-EUTRA-NRCellResourceCoordinationReqIEs}},

...

}

ENB-EUTRA-NRCellResourceCoordinationReqIEs X2AP-PROTOCOL-IES ::= {

{ ID id-DataTrafficResourceIndication CRITICALITY reject TYPE DataTrafficResourceIndication PRESENCE mandatory}|

{ ID id-SpectrumSharingGroupID CRITICALITY reject TYPE SpectrumSharingGroupID PRESENCE mandatory}|

{ ID id-ListofEUTRACellsinEUTRACoordinationReq CRITICALITY reject TYPE ListofEUTRACellsinEUTRACoordinationReq PRESENCE mandatory},

...

}

En-gNB-EUTRA-NRCellResourceCoordinationReqIEs X2AP-PROTOCOL-IES ::= {

{ ID id-DataTrafficResourceIndication CRITICALITY reject TYPE DataTrafficResourceIndication PRESENCE mandatory}|

{ ID id-ListofEUTRACellsinNRCoordinationReq CRITICALITY reject TYPE ListofEUTRACellsinNRCoordinationReq PRESENCE mandatory }|

{ ID id-SpectrumSharingGroupID CRITICALITY reject TYPE SpectrumSharingGroupID PRESENCE mandatory}|

{ ID id-ListofNRCellsinNRCoordinationReq CRITICALITY reject TYPE ListofNRCellsinNRCoordinationReq PRESENCE mandatory},

...

}

ListofEUTRACellsinEUTRACoordinationReq ::= SEQUENCE (SIZE (0..maxCellineNB)) OF ECGI

ListofEUTRACellsinNRCoordinationReq ::= SEQUENCE (SIZE (1..maxCellineNB)) OF ECGI

ListofNRCellsinNRCoordinationReq ::= SEQUENCE (SIZE (0..maxnoNRcellsSpectrumSharingWithE-UTRA)) OF NRCGI

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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-- E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

EUTRANRCellResourceCoordinationResponse ::= SEQUENCE {

protocolIEs ProtocolIE-Container {{EUTRANRCellResourceCoordinationResponse-IEs}},

...

}

EUTRANRCellResourceCoordinationResponse-IEs X2AP-PROTOCOL-IES ::= {

{ ID id-RespondingNodeType-EutranrCellResourceCoordination CRITICALITY reject TYPE RespondingNodeType-EutranrCellResourceCoordination PRESENCE mandatory}|

{ ID id-InterfaceInstanceIndication CRITICALITY reject TYPE InterfaceInstanceIndication PRESENCE optional },

...

}

RespondingNodeType-EutranrCellResourceCoordination ::= CHOICE {

respond-eNB ProtocolIE-Container {{ENB-EUTRA-NRCellResourceCoordinationReqAckIEs}},

respond-en-gNB ProtocolIE-Container {{En-gNB-EUTRA-NRCellResourceCoordinationReqAckIEs}},

...

}

ENB-EUTRA-NRCellResourceCoordinationReqAckIEs X2AP-PROTOCOL-IES ::= {

{ ID id-DataTrafficResourceIndication CRITICALITY reject TYPE DataTrafficResourceIndication PRESENCE mandatory}|

{ ID id-SpectrumSharingGroupID CRITICALITY reject TYPE SpectrumSharingGroupID PRESENCE mandatory}|

{ ID id-ListofEUTRACellsinEUTRACoordinationResp CRITICALITY reject TYPE ListofEUTRACellsinEUTRACoordinationResp PRESENCE mandatory},

...

}

En-gNB-EUTRA-NRCellResourceCoordinationReqAckIEs X2AP-PROTOCOL-IES ::= {

{ ID id-DataTrafficResourceIndication CRITICALITY reject TYPE DataTrafficResourceIndication PRESENCE mandatory}|

{ ID id-SpectrumSharingGroupID CRITICALITY reject TYPE SpectrumSharingGroupID PRESENCE mandatory}|

{ ID id-ListofNRCellsinNRCoordinationResp CRITICALITY reject TYPE ListofNRCellsinNRCoordinationResp PRESENCE mandatory},

...

}

ListofEUTRACellsinEUTRACoordinationResp ::= SEQUENCE (SIZE (0..maxCellineNB)) OF ECGI

ListofNRCellsinNRCoordinationResp ::= SEQUENCE (SIZE (0..maxnoNRcellsSpectrumSharingWithE-UTRA)) OF NRCGI

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/