**3GPP TSG-RAN WG3 Meeting #119bis-eR3-231738**

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.423** | **CR** | **1037** | **rev** | **-** | **Current version:** | 16.13.0 |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Correction on E-UTRA - NR Cell Resource Coordination | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Orange, China Telecom | | | | | | | | | |
| ***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:   * In E-UTRA - NR CELL RESOURCE COORDINATION REQUEST message, the presence of IE *List of E-UTRA Cells in E-UTRA Coordination Request* when initiating node type is ng-eNB and IE *List of NR Cells in NR Coordination Request* when initiating node type is gNB are not aligned between tabular (mandatory) and ASN.1 (optional). * Furthermore*,* when initiating node type is gNB, the presence of IE *List of E-UTRA Cells in E-UTRA Coordination Request* is optional while this IE shall be mandatory from function point of view. This IE is also mandatory in the same function in EN-DC case in X2AP. It was caused by a rapporteur update CR in R3-186900 to align to the ASN.1 without any evaluation. * In E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE message, the presence of IE *List of E-UTRA Cells in E-UTRA Coordination Response* and IE *List of NR Cells in NR Coordination Response* are not aligned between tabular (mandatory) and ASN.1 (optional). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The following changes re made:   * To add procedural texts for IE *List of E-UTRA Cells in E-UTRA Coordination Request* and IE *List of NR Cells in NR Coordination Request* to make them mandatory in the spec and implementation aligning to ASN.1. * To add procedural texts for IE *List of E-UTRA Cells in E-UTRA Coordination Response* and IE *List of NR Cells in NR Coordination Response* to make them mandatory in the spec and implementation aligning to ASN.1. * To update the tabular in E-UTRA - NR CELL RESOURCE COORDINATION REQUEST and response message to correctly reflect the optional presence for the list type IEs.   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 (same release) because we mandate the inclusion of some IEs in procedure text.  This CR has an impact under functional point of view.  The impact can be considered isolated because the change affects E-UTRA – NR Cell Resource Coordination. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 8.3.12.2, 9.1.2.23, 9.1.2.24 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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

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

#### 8.3.12.1 General

The purpose of the E-UTRA – NR Cell Resource Coordination procedure is to enable coordination of radio resource allocation between an ng-eNB and a gNB that are sharing spectrum and whose coverage areas are fully or partially overlapping. During the procedure, the ng-eNB and 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.

#### 8.3.12.2 Successful Operation



Figure 8.3.12.2-1: ng-eNB-initiated E-UTRA – NR Cell Resource Coordination request, successful operation



Figure 8.3.12.2-2: gNB-initiated E-UTRA – NR Cell Resource Coordination request, successful operation

If case of network sharing with multiple cell ID broadcast with shared Xn-C signalling transport, as specified in TS 38.300 [9], the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message and the E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message shall include the *Interface Instance Indication* IE to identify the corresponding interface instance.

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

An ng-eNB initiates the procedure by sending the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message to an gNB over the Xn interface. The gNB extracts the *Data Traffic Resource Indication* IE and it replies by sending the E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message. The gNB shall calculate the full ng-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 ng-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 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 EUTRA Cell IDin the *List of E-UTRA Cells in NR Coordination Request* IE.

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

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

An gNB initiates the procedure by sending the E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message to an ng-eNB. The ng-eNB replies with the E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message.

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 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 EUTRA Cell IDin the *List of E-UTRA Cells in NR Coordination Request* IE and one NR-Cell ID 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 IDin the *List of E-UTRA Cells in NR Coordination Response* IE.

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

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

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

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.3.1 |  | YES | reject |
| CHOICE*Initiating Node Type* | M |  |  |  | YES | reject |
| >ng-*eNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.2.30 | Indicates resource allocations for data traffic. | – |  |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxnoofCellsinNG-RANnode) | Indicates the E-UTRA cells involved in resource coordination with the NR cells affiliated with the same *Spectrum Sharing Group ID.* | – |  |
| **>>List of E-UTRA Cells in E-UTRA Coordination Request** |  | *0..1* |  | List of applicable E-UTRA cells. | YES | reject |
| **>>>List of E-UTRA Cells in E-UTRA Coordination Request Item** |  | *1.. < maxnoofCellsinNG-RANnode >* |  |  |  |  |
| >>>>EUTRA Cell ID | M |  | E-UTRA CGI 9.2.2.8 |  | – |  |
| >*gNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.2.30 | Indicates resource allocations for data traffic. | – |  |
| **>>List of E-UTRA Cells in NR Coordination Request** |  | *0..1* |  | List of applicable E-UTRA cells | YES | reject |
| **>>>List of E-UTRA Cells in E-UTRA Coordination Request Item** |  | *1 .. < maxnoofCellsinNG-RANnode >* |  |  |  |  |
| >>>>E-UTRA Cell ID | M |  | E-UTRA CGI 9.2.2.8 |  | – |  |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxnoofCellsinNG-RANnode) | Indicates the NR cells involved in resource coordination with the E-UTRA cells affiliated with the same *Spectrum Sharing Group ID.* | – |  |
| **>>List of NR Cells in NR Coordination Request** |  | *0..1* |  | List of applicable NR cells | YES | reject |
| **>>>List of NR Cells in NR Coordination Request Item** |  | *1.. < maxnoNRcellsSpectrumSharingwithE-UTRA >* |  |  |  |  |
| >>>>NR-Cell ID | M |  | NR CGI 9.2.2.7 |  | – |  |
| Interface Instance Indication | O |  | 9.2.2.39 |  | YES | reject |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoNRcellsSpectrumSharingwithE-UTRA | Maximum no. of NR cells affiliated to a *Spectrum Sharing Group ID* involved in cell resource coordination with a number of E-UTRA cells affiliated with the same *Spectrum Sharing Group ID*. Value is 64. |
| maxnoofCellsinNG-RANnode | Maximum no. cells that can be served by a NG-RAN node. Value is 16384. |

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

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

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

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.3.1 |  | YES | reject |
| CHOICE*Responding NodeType* | M |  |  |  | YES | reject |
| >ng-*eNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.2.30 | Indicates resource allocations for data traffic. | – |  |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxnoofCellsinNG-RANnode) | Indicates the E-UTRA cells involved in resource coordination with the NR cells affiliated with the same *Spectrum Sharing Group ID.* | – |  |
| **>>List of E-UTRA Cells in E-UTRA Coordination Response** |  | *0..1* |  | List of applicable E-UTRA cells | YES | reject |
| **>>>List of E-UTRA Cells in E-UTRA Coordination Response Item** |  | *1.. < maxnoofCellsinNG-RANnode >* |  |  |  |  |
| >>>>EUTRA Cell ID | M |  | E-UTRA CGI 9.2.2.8 |  | – |  |
| >*gNB* |  |  |  |  |  |  |
| >>Data Traffic Resource Indication | M |  | 9.2.2.30 | Indicates resource allocations for data traffic. | – |  |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1..maxnoofCellsinNG-RANnode) | Indicates the NR cells involved in resource coordination with the E-UTRA cells affiliated with the same *Spectrum Sharing Group ID.* | – |  |
| **>>List of NR Cells in NR Coordination Response** |  | *0..1* |  | List of applicable NR cells | YES | reject |
| **>>>List of NR Cells in NR Coordination Response Item** |  | *1.. < maxnoNRcellsSpectrumSharingwithE-UTRA >* |  |  |  |  |
| >>>>NR Cell ID | M |  | NR CGI 9.2.2.7 |  | – |  |
| Interface Instance Indication | O |  | 9.2.2.39 |  | YES | reject |

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

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

--

-- E-UTRA NR CELL RESOURCE COORDINATION REQUEST

--

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

E-UTRA-NR-CellResourceCoordinationRequest ::= SEQUENCE {

protocolIEs ProtocolIE-Container {{E-UTRA-NR-CellResourceCoordinationRequest-IEs}},

...

}

E-UTRA-NR-CellResourceCoordinationRequest-IEs XNAP-PROTOCOL-IES ::= {

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

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

...

}

InitiatingNodeType-ResourceCoordRequest ::= CHOICE {

ng-eNB ResourceCoordRequest-ng-eNB-initiated,

gNB ResourceCoordRequest-gNB-initiated,

choice-extension ProtocolIE-Single-Container { {InitiatingNodeType-ResourceCoordRequest-ExtIEs} }

}

InitiatingNodeType-ResourceCoordRequest-ExtIEs XNAP-PROTOCOL-IES ::= {

...

}

ResourceCoordRequest-ng-eNB-initiated ::= SEQUENCE {

dataTrafficResourceIndication DataTrafficResourceIndication,

spectrumSharingGroupID SpectrumSharingGroupID,

listofE-UTRACells SEQUENCE (SIZE(1.. maxnoofCellsinNG-RANnode)) OF E-UTRA-CGI OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {ResourceCoordRequest-ng-eNB-initiated-ExtIEs} } OPTIONAL,

...

}

ResourceCoordRequest-ng-eNB-initiated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

ResourceCoordRequest-gNB-initiated ::= SEQUENCE {

dataTrafficResourceIndication DataTrafficResourceIndication,

listofE-UTRACells SEQUENCE (SIZE(1.. maxnoofCellsinNG-RANnode)) OF E-UTRA-CGI OPTIONAL,

spectrumSharingGroupID SpectrumSharingGroupID,

listofNRCells SEQUENCE (SIZE(1.. maxnoofCellsinNG-RANnode)) OF NR-CGI OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {ResourceCoordRequest-gNB-initiated-ExtIEs} } OPTIONAL,

...

}

ResourceCoordRequest-gNB-initiated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

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

--

-- E-UTRA NR CELL RESOURCE COORDINATION RESPONSE

--

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

E-UTRA-NR-CellResourceCoordinationResponse::= SEQUENCE {

protocolIEs ProtocolIE-Container {{E-UTRA-NR-CellResourceCoordinationResponse-IEs}},

...

}

E-UTRA-NR-CellResourceCoordinationResponse-IEs XNAP-PROTOCOL-IES ::= {

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

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

...

}

RespondingNodeType-ResourceCoordResponse ::= CHOICE {

ng-eNB ResourceCoordResponse-ng-eNB-initiated,

gNB ResourceCoordResponse-gNB-initiated,

choice-extension ProtocolIE-Single-Container { {RespondingNodeType-ResourceCoordResponse-ExtIEs} }

}

RespondingNodeType-ResourceCoordResponse-ExtIEs XNAP-PROTOCOL-IES ::= {

...

}

ResourceCoordResponse-ng-eNB-initiated ::= SEQUENCE {

dataTrafficResourceIndication DataTrafficResourceIndication,

spectrumSharingGroupID SpectrumSharingGroupID,

listofE-UTRACells SEQUENCE (SIZE(1.. maxnoofCellsinNG-RANnode)) OF E-UTRA-CGI OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {ResourceCoordResponse-ng-eNB-initiated-ExtIEs} } OPTIONAL,

...

}

ResourceCoordResponse-ng-eNB-initiated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

ResourceCoordResponse-gNB-initiated ::= SEQUENCE {

dataTrafficResourceIndication DataTrafficResourceIndication,

spectrumSharingGroupID SpectrumSharingGroupID,

listofNRCells SEQUENCE (SIZE(1.. maxnoofCellsinNG-RANnode)) OF NR-CGI OPTIONAL,

iE-Extensions ProtocolExtensionContainer { {ResourceCoordResponse-gNB-initiated-ExtIEs} } OPTIONAL,

...

}

ResourceCoordResponse-gNB-initiated-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

...

}

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