**3GPP TSG-RAN WG3 Meeting #127-bis R3-252389**

**Wuhan, China, 7-11 April, 2025**

**Agenda item: 19.2**

**Source: Huawei, China Telecom, China Unicom**

**Title: (TP to BL CR for 38.423) introduction of Evolution of NR duplex operation: Sub-band full duplex (SBFD)**

**Document for: Discussion & Approval**

# 1. Introduction

This TP tries to capture the agreements achieved for SBFD.

# 2. Reference

[1]. R3-252213, Further discussions on SBFD related information exchange, Huawei, China Telecom, China Unicom.

# Annex: TP to TS 38.423

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.423** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  |
| *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:***  | (TP to BL CR for 38.423) introduction of Evolution of NR duplex operation: Sub-band full duplex (SBFD) |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_duplex\_evo-core |  | ***Date:*** | 2025-03-28 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *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 canbe 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | The WID objective for CLI handling related to information exchange among gNBs are as follows:* + - Information exchange among gNBs, including [RAN3]
			* Semi-static cell-specific SBFD time and frequency location configuration
			* Measurement resource configuration, i.e., SSB and/or periodic NZP CSI-RS
			* Strongest DL beam information
			* CLI-mitigation request
 |
|  |  |
| ***Summary of change:*** | * Introduce the SBFD configuration in *Served Cell Information NR* IE.
* Introduce new procedure of CLI Measurement Reporting.

Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has no impact with the previous version of the specification (same release).  |
|  |  |
| ***Consequences if not approved:*** | The CLI measurement for SBFD should not be support. |
|  |  |
| ***Clauses affected:*** | 8.1, 8.4.y(new), 9.1.3.y(new), 9.2.2.11, 9.2.2.x(new), 9.3.3, 9.3.4, 9.3.5, and 9.3.7  |
|  |  |
|  | **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:*** | Rev -: submitted to RAN3#125bisRev 1: resubmitted to RAN3#126 with updates |

**=============================start of change==============================**

8.1 Elementary procedures

In the following tables, all EPs are divided into Class 1 and Class 2 EPs.

**Table 8.1-1: Class 1 Elementary Procedures**

| **Elementary Procedure** | **Initiating Message** | **Successful Outcome** | **Unsuccessful Outcome** |
| --- | --- | --- | --- |
| **Response message** | **Response message** |
| Handover Preparation | HANDOVER REQUEST | HANDOVER REQUEST ACKNOWLEDGE | HANDOVER PREPARATION FAILURE |
| Retrieve UE Context | RETRIEVE UE CONTEXT REQUEST | RETRIEVE UE CONTEXT RESPONSE | RETRIEVE UE CONTEXT FAILURE |
| S-NG-RAN node Addition Preparation | S-NODE ADDITION REQUEST | S-NODE ADDITION REQUEST ACKNOWLEDGE | S-NODE ADDITION REQUEST REJECT |
| M-NG-RAN node initiated S-NG-RAN node Modification Preparation | S-NODE MODIFICATION REQUEST | S-NODE MODIFICATION REQUEST ACKNOWLEDGE | S-NODE MODIFICATION REQUEST REJECT |
| S-NG-RAN node initiated S-NG-RAN node Modification | S-NODE MODIFICATION REQUIRED | S-NODE MODIFICATION CONFIRM | S-NODE MODIFICATION REFUSE |
| S-NG-RAN node initiated S-NG-RAN node CHANGE | S-NODE CHANGE REQUIRED | S-NODE CHANGE CONFIRM | S-NODE CHANGE REFUSE |
| M-NG-RAN node initiated S-NG-RAN node Release | S-NODE RELEASE REQUEST | S-NODE RELEASE REQUEST ACKNOWLEDGE | S-NODE RELEASE REJECT |
| S-NG-RAN node initiated S-NG-RAN node Release | S-NODE RELEASE REQUIRED | S-NODE RELEASE CONFIRM |  |
| Xn Setup  | XN SETUP REQUEST | XN SETUP RESPONSE | XN SETUP FAILURE |
| NG-RAN node Configuration Update | NG-RAN NODE CONFIGURATION UPDATE | NG-RAN NODE CONFIGURATION UPDATE ACKNOWLEDGE | NG-RAN NODE CONFIGURATION UPDATE FAILURE |
| Cell Activation | CELL ACTIVATION REQUEST | CELL ACTIVATION RESPONSE | CELL ACTIVATION FAILURE |
| Reset | RESET REQUEST | RESET RESPONSE |  |
| Xn Removal | XN REMOVAL REQUEST | XN REMOVAL RESPONSE | XN REMOVAL FAILURE |
| E-UTRA - NR Cell Resource Coordination | E-UTRA - NR CELL RESOURCE COORDINATION REQUEST | E-UTRA - NR CELL RESOURCE COORDINATION RESPONSE |  |
| Resource Status Reporting Initiation | RESOURCE STATUS REQUEST | RESOURCE STATUS RESPONSE | RESOURCE STATUS FAILURE |
| Mobility Settings Change | MOBILITY CHANGE REQUEST | MOBILITY CHANGE ACKNOWLEDGE | MOBILITY CHANGE FAILURE |
| IAB Transport Migration Management | IAB TRANSPORT MIGRATION MANAGEMENT REQUEST | IAB TRANSPORT MIGRATION MANAGEMENT RESPONSE | IAB TRANSPORT MIGRATION MANAGEMENT REJECT |
| IAB Transport Migration Modification | IAB TRANSPORT MIGRATION MODIFICATION REQUEST | IAB TRANSPORT MIGRATION MODIFICATION RESPONSE |  |
| IAB Resource Coordination | IAB RESOURCE COORDINATION REQUEST | IAB RESOURCE COORDINATION RESPONSE |  |
| Partial UE Context Transfer | PARTIAL UE CONTEXT TRANSFER | PARTIAL UE CONTEXT TRANSFER ACKNOWLEDGE | PARTIAL UE CONTEXT TRANSFER FAILURE |
| Data Collection Reporting Initiation | DATA COLLECTION REQUEST | DATA COLLECTION RESPONSE | DATA COLLECTION FAILURE |

**Table 8.1-2: Class 2 Elementary Procedures**

| **Elementary Procedure** | **Initiating Message** |
| --- | --- |
| Handover Cancel | HANDOVER CANCEL |
| SN Status Transfer | SN STATUS TRANSFER |
| RAN Paging | RAN PAGING |
| Xn-U Address Indication | XN-U ADDRESS INDICATION |
| S-NG-RAN node Reconfiguration Completion | S-NODE RECONFIGURATION COMPLETE |
| S-NG-RAN node Counter Check | S-NODE COUNTER CHECK REQUEST |
| UE Context Release | UE CONTEXT RELEASE |
| RRC Transfer | RRC TRANSFER |
| Error Indication | ERROR INDICATION |
| Notification Control Indication | NOTIFICATION CONTROL INDICATION |
| Activity Notification | ACTIVITY NOTIFICATION |
| Secondary RAT Data Usage Report | SECONDARY RAT DATA USAGE REPORT |
| Trace Start | TRACE START |
| Deactivate Trace | DEACTIVATE TRACE |
| Handover Success | HANDOVER SUCCESS |
| Conditional Handover Cancel | CONDITIONAL HANDOVER CANCEL |
| Early Status Transfer | EARLY STATUS TRANSFER |
| Failure Indication | FAILURE INDICATION |
| Handover Report | HANDOVER REPORT |
| Resource Status Reporting | RESOURCE STATUS UPDATE |
| Access And Mobility Indication | ACCESS AND MOBILITY INDICATION |
| Cell Traffic Trace | CELL TRAFFIC TRACE |
| RAN Multicast Group Paging | RAN MULTICAST GROUP PAGING |
| SCG Failure Information Report | SCG FAILURE INFORMATION REPORT |
| SCG Failure Transfer | SCG FAILURE TRANSFER |
| F1-C Traffic Transfer | F1-C TRAFFIC TRANSFER |
| Retrieve UE Context Confirm | RETRIEVE UE CONTEXT CONFIRM |
| Conditional PSCell Change Cancel | CONDITIONAL PSCELL CHANGE CANCEL |
| RACH Indication | RACH INDICATION |
| Data Collection Reporting | DATA COLLECTION UPDATE |
| CLI Measurement Reporting | CLI MEASUREMENT UPDATE |

**=============================Next change==============================**

8.4.y CLI Measurement Reporting

8.4.y.1 General

This procedure is initiated by NG-RAN node2 to NG-RAN node1, and NG-RAN node2 reports the result of CLI measurements and to request the CLI mitigation.

The procedure uses non UE-associated signalling.

8.4.y.2 Successful Operation

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**Figure 8.4.y.2-1: CLI Measurement Reporting, successful operation**

NG-RAN node2 shall report the results of the CLI measurements in CLI MEASUREMENT UPDATE message.

Editor’s Note: The procedure and message name might be updated pending on further discussion.

**=============================Next change==============================**

9.1.3.y CLI MEASUREMENT UPDATE

This message is sent by NG-RAN node2 to NG-RAN node1 to report the results of the requested CLI measurements.

Direction: NG-RAN node2 → NG-RAN node1.

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| Message Type | M |  | 9.2.3.1 |  | YES | ignore |
| **CLI Measurement Result** |  | *1* |  |  | YES | ignore |
| **>CLI Measurement Result Item** |  | *1 .. < maxnoofCellsinNG-RANnode >* |  |  | YES | ignore |
| >>Cell ID | M |  | Global NG-RAN Cell Identity9.2.2.27 |  | – |  |
| >>SSB index | O |  | INTEGER (0..63) | Strongest DL SSB beam information |  |  |
| >>NZP CSI-RS Resource Indication | O |  | INTEGER (1..64) | Strongest DL NZP CSI-RS beam information |  |  |
| >>CLI Mitigation Indication | O |  | ENUMERATED (true, …) | Indicates to request CLI mitigation |  |  |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofCellsinNG-RANnode | Maximum no. cells that can be served by a NG-RAN node. Value is 16384. |

**=============================Next change==============================**

9.2.2.11 Served Cell Information NR

This IE contains cell configuration information of an NR cell that a neighbouring NG-RAN node may need for the Xn AP interface.

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| NR-PCI | M |  | INTEGER (0..1007, …) | NR Physical Cell ID | – |  |
| NR CGI | M |  | 9.2.2.7 |  | – |  |
| TAC | M |  | 9.2.2.5 | Tracking Area Code | – |  |
| RANAC | O |  | RAN Area Code9.2.2.6 |  | – |  |
| **Broadcast PLMNs** |  | *1..<maxnoofBPLMNs>* |  | Broadcast PLMNs contained in the *SIB1* message as specified in TS 38.331[10], associated to the NR Cell Identity in the *NR CGI* IE. | – |  |
| >PLMN Identity | M |  | 9.2.2.4 |  | – |  |
| CHOICE *NR-Mode-Info* | M |  |  |  | – |  |
| >*FDD* |  |  |  |  |  |  |
| >>**FDD Info** |  | *1* |  |  | – |  |
| >>>UL NR Frequency Info | M |  | NR Frequency Info9.2.2.19 | This IE is ignored for NR operating bands for which uplink range of NREF is not defined in section 5.4.2.3 of TS 38.104 [24]. | – |  |
| >>>DL NR Frequency Info | M |  | NR Frequency Info9.2.2.19 |  | – |  |
| >>>UL Transmission Bandwidth | M |  | NR Transmission Bandwidth9.2.2.20 | This IE is ignored for NR operating bands for which uplink range of NREF is not defined in section 5.4.2.3 of TS 38.104 [24]. | – |  |
| >>>DL Transmission Bandwidth | M |  | NR Transmission Bandwidth9.2.2.20 |  | – |  |
| >>>UL Carrier List  | O |  | NR Carrier List9.2.2.63 | If included, the *UL Transmission Bandwidth* IE shall be ignored. | YES | ignore |
| >>>DL Carrier List | O |  | NR Carrier List9.2.2.63 | If included, the *DL Transmission Bandwidth* IE shall be ignored. | YES | ignore |
| >>>gNB-DU Cell Resource Configuration-FDD-UL | O |  | gNB-DU Cell Resource Configuration9.2.2.95 | Contains FDD UL resource configuration of gNB-DU’s cell. Only applicable if the gNB-DU is an IAB-DU or an IAB-donor-DU. | YES | ignore |
| >>>gNB-DU Cell Resource Configuration-FDD-DL | O |  | gNB-DU Cell Resource Configuration9.2.2.95 | Contains FDD UL resource configuration of gNB-DU’s cell. Only applicable if the gNB-DU is an IAB-DU or an IAB-donor-DU. | YES | ignore |
| >*TDD* |  |  |  |  |  |  |
| >>**TDD Info** |  | *1* |  |  | – |  |
| >>>Frequency Info | M |  | NR Frequency Info9.2.2.19 |  | – |  |
| >>>Transmission Bandwidth | M |  | NR Transmission Bandwidth9.2.2.20 | This IE is ignored if the *Transmission Bandwidth asymmetric* IE is present. | – |  |
| >>>Intended TDD DL-UL Configuration NR | O |  | 9.2.2.40 |  | YES | ignore |
| >>>TDD UL-DL Configuration Common NR  | O |  | OCTET STRING | Includes the *tdd-UL-DL-ConfigurationCommon* contained in the *SIB1* message as defined in TS 38.331 [10] | YES | ignore |
| >>>Carrier List  | O |  | NR Carrier List9.2.2.63 | If included, the *Transmission Bandwidth* IE shall be ignored. | YES | ignore |
| >>>gNB-DU Cell Resource Configuration-TDD | O |  | gNB-DU Cell Resource Configuration9.2.2.95 | Contains FDD UL resource configuration of gNB-DU’s cell. Only applicable if the gNB-DU is an IAB-DU or an IAB-donor-DU. | YES | ignore |
| **>>>Transmission Bandwidth asymmetric** |  | *0..1* |  | Indicates the asymmetric UL and DL transmission bandwidth. | YES | ignore |
| >>>>UL Transmission Bandwidth | M |  | NR Transmission Bandwidth9.2.2.20 |  | – |  |
| >>>>DL Transmission Bandwidth | M |  | NR Transmission Bandwidth9.2.2.20 |  | – |  |
| >>>SBFD Configuration  | O |  | FFS (pending on RAN2 progress) |  | YES | ignore |
| Measurement Timing Configuration | M |  | OCTET STRING | Includes the *MeasurementTimingConfiguration* inter-node message for the served cell, as defined in TS 38.331 [10]. | – |  |
| Connectivity Support | M |  | 9.2.2.28 |  | – |  |
| **Broadcast PLMN Identity Info List NR** |  | *0..<maxnoofBPLMNs>* |  | This IE corresponds to information provided in the *PLMN-IdentityInfoList* IE and the *NPN-IdentityInfoList* IE (if available) in *SIB1* as specified in TS 38.331 [10]. All PLMN Identities and associated information contained in the *PLMN-IdentityInfoList* IE and NPN identities and associated information contained in the *NPN-IdentityInfoList* IE (if available) are included and provided in the same order as broadcast in the *SIB1* message.NOTE: In case of NPN-only cell, the PLMN Identities and associated information contained in the *PLMN-IdentityInfoList* IE are not included. | YES | ignore |
| **>****Broadcast PLMNs** |  | *1..<maxnoofBPLMNs>* |  | Broadcast PLMNs in the *SIB1* message, associated to the *NR Cell Identity* IE. | – |  |
| >>PLMN Identity | M |  | 9.2.2.4 |  | – |  |
| >TAC | M |  | 9.2.2.5 |  | – |  |
| >NR Cell Identity | M |  | BIT STRING (SIZE(36)) |  | – |  |
| >RANAC | O |  | RAN Area Code9.2.2.6 |  | – |  |
| >Configured TAC Indication | O |  | 9.2.2.39a | NOTE: This IE is associated with the TAC in the *Broadcast PLMN Identity Info List NR* IE | YES | ignore |
| >NPN Broadcast Information | O |  | 9.2.2.71 | If this IE is included the content of the *Broadcast PLMNs* IE in the *Broadcast PLMN Identity Info List NR* IE is ignored. | YES | reject |
| Configured TAC Indication | O |  | 9.2.2.39a | NOTE: This IE is associated with the TAC on top-level of the *Served Cell Information NR* IE | YES | ignore |
| NPN Broadcast Information | O |  | 9.2.2.71 | If this IE is included the content of the *Broadcast PLMNs* IE in the top *Served Cell Information NR* IE is ignored. | YES | reject |
| SSB Positions In Burst | O |  | 9.2.2.64 |  | YES | ignore |
| NR Cell PRACH Configuration | O |  | OCTET STRING | Includes the *NR Cell PRACH Configuration* IE as defined in section 9.3.1.139 in TS 38.473 [41]. | YES | ignore |
| CSI-RS Transmission Indication | O |  | ENUMERATED (activated, deactivated, ...) | This IE indicates the CSI-RS transmission status of the given cell.If the *Additional Measurement Timing Configuration List* IE is present, this IE is ignored. | YES | ignore |
| SFN Offset | O |  | 9.2.2.75 |  | YES | ignore |
| **Supported MBS FSA ID List** |  | *0..<maxnoofMBSFSAs>* |  | Shall contain all MBS Frequency Selection Area Identities associated to the NR Cell Identity in the *NR CGI* IE. | YES | ignore |
| >MBS Frequency Selection Area Identity | M |  | OCTET STRING(3) | Corresponds to information provided in the *MBS-FSAI* IE as defined in TS 38.331 [10]. | – |  |
| **NR-U Channel Info List** |  | *0..1* |  |  | YES | ignore |
| **>NR-U Channel Info Item** |  | *1..<maxnoofNR-UChannelIDs>* |  |  | – |  |
| >>NR-U Channel ID | M |  | INTEGER (1.. maxnoofNR-UChannelIDs, …) | Index to uniquely identify the part of the NR-U Channel Bandwidth consisting of a contiguous set of resource blocks (RBs) on which a channel access procedure is performed in shared spectrum.Value 1 represents the first part of the NR-U Channel Bandwidth on which a channel access procedure is performed. Value 2 represents the second part of the NR-U Channel Bandwidth on which a channel access procedure is performed, and so on. | – |  |
| >>NR ARFCN | M |  | INTEGER (0.. maxNRARFCN) | It represents the centre frequency of the NR-U Channel Bandwidth for NR bands restricted to operation with shared spectrum channel access, as defined in TS 37.213 [51]. Allowed values are specified in 38.101-1 [52] in Table 5.4.2.3-2, Table 5.4.2.3-3 and Table 5.4.2.3-4. | – |  |
| >>Bandwidth | M |  | ENUMERATED (10MHz, 20MHz, 40MHz, 60MHz, 80MHz, …,100MHz) |  | – |  |
| **Additional Measurement Timing Configuration List** | O | *1 .. <maxnoofMTCItems>* |  |  | YES | ignore |
| >Measurement Timing Configuration Index | M |  | INTEGER (0..16) | “0” refers to the configuration contained in the Measurement Timing Configuration IE.Any value between “1” and “16” refers to a configuration within the *Additional Measurement Timing Configuration List* IE.  | – |  |
| >**CSI- RS MTC Configuration List** | M | *1 .. <maxnoofCSIRSconfigurations*> |  | This list explicitly expresses the CSI-RS configurations contained in the MTC | – |  |
| >>CSI-RS Index | M |  | INTEGER (0..95) | Index of CSI-RS as in MTC | – |  |
| >>CSI-RS Status | M |  | ENUMERATED (activated, deactivated, …) | This IE indicates the CSI-RS transmission status of the configuration. | – |  |
| >>**CSI-RS Neighbour List** | O | *1 .. <maxnoofCSIRSneighbourCells>* |  | This list expresses the cells and CSI-RSs neighbouring the CSI-RS in the *CSI-RS Index* IE. | – |  |
| >>>NR CGI | M |  | 9.2.2.7 |  | – |  |
| >>>**CSI-RS MTC Neighbour List** | O | *1 .. < maxnoofCSIRSneighbourCellsInMT*C> |  | This list expresses the CSI-RSs served by the NR CGI, which are neighbouring the CSI-RS of the served cell and contained in the MTC indicated by the neighbouring NR cell. | – |  |
| >>>>CSI-RS Index | M |  | INTEGER (0..95) |  | – |  |
| RedCap Broadcast Information | O |  | BIT STRING (SIZE(8)) | The presence of this IE indicates that the *intraFreqReselectionRedC*ap is broadcast in the *SIB1* message of the corresponding cell, see TS 38.331 [10].Each position in the bitmap indicates which RedCap UEs are allowed access, according to the setting of RedCap barring indicators in the *SIB1* message, see TS 38.331 [10].First bit = 1Rx,second bit = 2Rx,third bit = halfDuplex,other bits reserved for future use. Value '1' indicates 'access allowed'. Value '0' indicates 'access not allowed”. | YES | ignore |
| eRedCap Broadcast Information | O |  | BIT STRING (SIZE(8)) | The presence of this IE indicates that the *intraFreqReselection-eRedCap* IE is broadcast in SIB1 of the corresponding cell, see TS 38.331 [10].Each position in the bitmap indicates which eRedCap UEs are allowed access, according to the setting of the barring indicators in SIB1, see TS 38.331 [10].First bit = 1Rx,second bit = 2Rx,third bit = half-duplex,other bits reserved for future use. Value '1' indicates 'access allowed'. Value '0' indicates 'access not allowed'. | YES | ignore |
| Mobile IAB Cell | O |  | 9.2.2.106 |  | YES | ignore |
| XR Broadcast Information | O |  | ENUMERATED (true, …) | Corresponds to information provided in the *cellBarred2RxXR* contained in the *SIB1* message as defined in TS 38.331 [10]. | YES | ignore |
| Barring Exemption for Emergency Call Information | O |  | ENUMERATED (true, ...) | Corresponds to information provided in the *barringExemptEmergencyCall* contained in the *SIB1* message as defined in 38.331 [10]. | YES | ignore |
| NZP CSI-RS Resources Configuration | O |  | 9.2.2.x2 |  | YES | ignore |

| **Range bound** | **Explanation** |
| --- | --- |
| maxnoofBPLMNs | Maximum no. of broadcast PLMNs by a cell. Value is 12. |
| maxnoofMBSFSAs | Maximum no. of MBS FSAs by one gNB. Value is 256. |
| maxnoofNR-UChannelIDs | Maximum no. NR-U channel IDs in a cell. Value is 16. |
| maxnoofMTCItems | Maximum no. of measurement timing configurations associated with the neighbour cell. Value is 16. |
| maxnoofCSIRSconfigurations | Maximum number of CSI RS configurations reported in the MTC. Value is 96 |
| maxnoofCSIRSneighbourCells | Maximum number of cells neighbouring a CSI-RS coverage area. Value is 16 |
| maxnoofCSIRSneighbourCellsInMTC | Maximum number of CSI-RS coverage areas neighbouring a specific CSI-RS coverage area. Value is 16 |

**=============================Next change==============================**

#### 9.2.2.x2 NZP CSI-RS Resources Configuration

This IE contains the NZP CSI-RS resources configuration of an NR cell.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| NZP-CSI-RS-ResourceSet | M |  | OCTET STRING | Includes the *NZP-CSI-RS-ResourceSet* IE, as defined in TS 38.331 [10]. |
| **NZP-CSI-RS-Resource List** |  | *1* |  |  |
| **>NZP-CSI-RS-Resource Item** |  | *1..<maxnoofNZP-CSI-RS-ResourcesPerSet>* |  |  |
| >>NZP-CSI-RS-Resource | M |  | OCTET STRING | Includes the *NZP-CSI-RS-Resource* IE, as defined in TS 38.331 [10]. |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoofNZP-CSI-RS-ResourcesPerSet | Maximum no. of NZP CSI-RS resources per resource set. Value is 64. |

**=============================Next change==============================**

9.3.3 Elementary Procedure Definitions

-- ASN1START

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

--

-- Elementary Procedure definitions

--

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

XnAP-PDU-Descriptions {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) xnap (2) version1 (1) xnap-PDU-Descriptions (0) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

--

-- IE parameter types from other modules.

--

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

IMPORTS

 Criticality,

 ProcedureCode

FROM XnAP-CommonDataTypes

 HandoverRequest,

 HandoverRequestAcknowledge,

////Skip Unchanged Part

 PartialUEContextTransferAcknowledge,

 PartialUEContextTransferFailure,

 RachIndication,

 DataCollectionRequest,

 DataCollectionResponse,

 DataCollectionFailure,

 DataCollectionUpdate,

 CLI-MeasurementUpdate

////Skip Unchanged Part

 id-iABResourceCoordination,

 id-retrieveUEContextConfirm,

 id-cPCCancel,

 id-partialUEContextTransfer,

 id-rachIndication,

 id-dataCollectionReportingInitiation,

 id-dataCollectionReporting,

 id-cLI-MeasurementReporting

////Skip Unchanged Part

 f1CTrafficTransfer |

 retrieveUEContextConfirm |

 cPCCancel |

 rachIndication |

 dataCollectionReporting |

 cLI-MeasurementReporting,

 ...

}

////Skip Unchanged Part

dataCollectionReportingInitiation XNAP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE DataCollectionRequest

 SUCCESSFUL OUTCOME DataCollectionResponse

 UNSUCCESSFUL OUTCOME DataCollectionFailure

 PROCEDURE CODE id-dataCollectionReportingInitiation

 CRITICALITY reject

}

dataCollectionReporting XNAP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE DataCollectionUpdate

 PROCEDURE CODE id-dataCollectionReporting

 CRITICALITY ignore

}

cLI-MeasurementReporting XNAP-ELEMENTARY-PROCEDURE ::= {

 INITIATING MESSAGE CLI-MeasurementUpdate

 PROCEDURE CODE id-cLI-MeasurementReporting

 CRITICALITY ignore

}

END

-- ASN1STOP

**=============================Next change==============================**

9.3.4 PDU Definitions

-- ASN1START

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

--

-- PDU definitions for XnAP.

--

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

 CellMeasurementResultForDataCollection-List,

 CellToReportForDataCollection-List,

 CandidateRelayUEInfoList,

 NRPagingLongeDRXInformationforRRCINACTIVE,

 QMCCoordinationRequest,

 QMCCoordinationResponse,

 DirectForwardingPathAvailabilityWithSourceMN,

 Conditional-Reconfig-List,

 PDUSetbasedHandlingIndicator,

 MobileIAB-AuthorizationStatus,

 BAPAddress,

 S-CPAC-Request,

 SK-COUNTER,

 RegistrationRequestForDataCollection,

 ReportCharacteristicsForDataCollection,

 ReportingPeriodicityForDataCollection,

 NodeAssociatedInfoResult,

 SLPositioning-Ranging-Services-Info,

 PDUSessionsListToBeReleased-UPError,

 UserPlaneFailureIndication,

 SRSPositioningConfigOrActivationRequest,

 NRPPaPositioningInformation,

 CLI-MeasurementResult-List

////Skip Unchanged Part

 id-QoE-Measurement-Results,

 id-Src-SN-to-Tgt-SNQMCInfoInquiry,

 id-DirectForwardingPathAvailabilityWithSourceMN,

 id-accessed-PSCellID,

 id-conditional-Reconfig-ToCancel-List,

 id-PDUSetbasedHandlingIndicator,

 id-MobileIAB-AuthorizationStatus,

 id-MIAB-MT-BAP-Address,

 id-S-CPAC-Request,

 id-sk-Counter,

 id-Source-M-NG-RANnodeID,

 id-SourceSN-to-TargetSN-QMCInfo,

 id-RegistrationRequestForDataCollection,

 id-ReportCharacteristicsForDataCollection,

 id-ReportingPeriodicityForDataCollection,

 id-NodeAssociatedInfoResult,

 id-SLPositioning-Ranging-Services-Info,

 id-PDUSessionsListToBeReleased-UPError,

 id-UserPlaneFailureIndication,

 id-SRSPositioningConfigOrActivationRequest,

 id-NRPPaPositioningInformation,

 id-CLI-MeasurementResult-List,

////Skip Unchanged Part

DataCollectionUpdate-IEs XNAP-PROTOCOL-IES ::= {

 { ID id-NGRAN-Node1-Measurement-ID CRITICALITY reject TYPE Measurement-ID PRESENCE mandatory}|

 { ID id-NGRAN-Node2-Measurement-ID CRITICALITY reject TYPE Measurement-ID PRESENCE mandatory}|

 { ID id-CellMeasurementResultForDataCollection-List CRITICALITY ignore TYPE CellMeasurementResultForDataCollection-List PRESENCE optional }|

 { ID id-UEAssociatedInfoResult-List CRITICALITY ignore TYPE UEAssociatedInfoResult-List PRESENCE optional }|

 { ID id-NodeAssociatedInfoResult CRITICALITY ignore TYPE NodeAssociatedInfoResult PRESENCE optional },

 ...

}

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

--

-- CLI Measurement Update

--

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

CLI-MeasurementUpdate ::= SEQUENCE {

 protocolIEs ProtocolIE-Container {{CLI-MeasurementUpdate-IEs}},

 ...

}

CLI-MeasurementUpdate-IEs XNAP-PROTOCOL-IES ::= {

 { ID id-CLI-MeasurementResult-List CRITICALITY ignore TYPE CLI-MeasurementResult-List PRESENCE mandatory },

 ...

}

END

-- ASN1STOP

**=============================Next change==============================**

9.3.5 Information Element definitions

-- ASN1START

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

--

-- Information Element Definitions

--

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

////Skip Unchanged Part

 id-AssistanceInformationQoE-Meas,

 id-QoERVQoEReportingPaths,

 id-DirectForwardingPathAvailability,

 id-CHO-CPAC-Info,

 id-CHO-Maxnoof-CondReconfig,

 id-PDUSetQoSParameters,

 id-N6JitterInformation,

 id-ECNMarkingorCongestionInformationReportingRequest,

 id-TAISliceUnavailableCellList,

 id-MobileIABCell,

 id-XR-Bcast-Information,

 id-MaximumDataBurstVolume,

 id-CPAC-Preparation-Type,

 id-MN-only-MDT-collection,

 id-BarringExemptionforEmerCallInfo,

 id-Transmission-Bandwidth-asymmetric,

 id-NRPPaPositioningInformation,

 id-SBFD-Configuration,

 id-NZP-CSI-RS-Resources-Config,

 maxEARFCN,

 maxnoofAllowedAreas,

 maxnoofAMFRegions,

 maxnoofAoIs,

 maxnoofBPLMNs,

 maxnoofCAGs,

////Skip Unchanged Part

 maxnoofUEReports,

 maxnoofCandidateRelayUEs,

 maxnoofCAGforMDT,

 maxnoofMDTSNPNs,

 maxnoofSecurityConfigurations,

 maxnoofRSPPQoSFlows,

 maxnoofNZP-CSI-RS-ResourcesPerSet

CellMeasurementInitiationResult-List ::= SEQUENCE (SIZE(1..maxnoofCellsinNG-RANnode)) OF CellMeasurementInitiationResult-Item

CellMeasurementInitiationResult-Item ::= SEQUENCE {

 cellID GlobalNG-RANCell-ID,

 cellMeasurementFailureCause-List CellMeasurementFailureCause-List OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { CellMeasurementInitiationResult-Item-ExtIEs} } OPTIONAL,

 ...

}

CellMeasurementInitiationResult-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

CLI-MeasurementResult-List ::= SEQUENCE (SIZE(1..maxnoofCellsinNG-RANnode)) OF CLI-MeasurementResult-Item

CLI-MeasurementResult-Item ::= SEQUENCE {

 cellID GlobalNG-RANCell-ID,

 ssbIndex INTEGER(0..63,...) OPTIONAL,

 nZP-CSI-RS-ResourceIndication INTEGER(1..64,...) OPTIONAL,

 cLI-MitigationIndication CLI-MitigationIndication OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { {CLI-MeasurementResult-Item-ExtIEs} } OPTIONAL,

 ...

}

CLI-MeasurementResult-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

CLI-MitigationIndication ::= ENUMERATED {true,...}

CellMeasurementResultForDataCollection-List ::= SEQUENCE (SIZE(1..maxnoofCellsinNG-RANnode)) OF CellInfoResultForDataCollection-Item

CellInfoResultForDataCollection-Item ::= SEQUENCE {

 cellID GlobalNG-RANCell-ID,

 predictedRadioResourceStatus RadioResourceStatus OPTIONAL,

 predictedNumberofActiveUEs NumberofActiveUEs OPTIONAL,

 predictedRRCConnections RRCConnections OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { {CellInfoResultForDataCollection-Item-ExtIEs} } OPTIONAL,

 ...

}

CellInfoResultForDataCollection-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

////Skip Unchanged Part

NRModeInfoTDD ::= SEQUENCE {

 nrFrequencyInfo NRFrequencyInfo,

 nrTransmissonBandwidth NRTransmissionBandwidth,

 iE-Extension ProtocolExtensionContainer { {NRModeInfoTDD-ExtIEs} } OPTIONAL,

 ...

}

NRModeInfoTDD-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 { ID id-IntendedTDD-DL-ULConfiguration-NR CRITICALITY ignore EXTENSION IntendedTDD-DL-ULConfiguration-NR PRESENCE optional }|

 { ID id-TDDULDLConfigurationCommonNR CRITICALITY ignore EXTENSION TDDULDLConfigurationCommonNR PRESENCE optional }|

 { ID id-CarrierList CRITICALITY ignore EXTENSION NRCarrierList PRESENCE optional }|

 { ID id-tdd-GNB-DU-Cell-Resource-Configuration CRITICALITY ignore EXTENSION GNB-DU-Cell-Resource-Configuration PRESENCE optional }|

 { ID id-Transmission-Bandwidth-asymmetric CRITICALITY ignore EXTENSION Transmission-Bandwidth-asymmetric PRESENCE optional }|

 { ID id-SBFD-Configuration CRITICALITY ignore EXTENSION SBFD-Configuration PRESENCE optional },

 ...

}

////Skip Unchanged Part

NRUESidelinkAggregateMaximumBitRate-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

NSAG-ID ::= INTEGER (0..255, ...)

NZP-CSI-RS-Resources-Config ::= SEQUENCE {

 nZP-CSI-RS-ResourceSet OCTET STRING,

 nZP-CSI-RS-Resource-List NZP-CSI-RS-Resource-List,

 iE-Extensions ProtocolExtensionContainer { {NZP-CSI-RS-Resources-Config-ExtIEs} } OPTIONAL,

 ...

}

NZP-CSI-RS-Resources-Config-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

NZP-CSI-RS-Resource-List ::= SEQUENCE (SIZE(1..maxnoofNZP-CSI-RS-ResourcesPerSet)) OF NZP-CSI-RS-Resource-Item

NZP-CSI-RS-Resource-Item ::= SEQUENCE {

 nZP-CSI-RS-Resource OCTET STRING,

 iE-Extensions ProtocolExtensionContainer { {NZP-CSI-RS-Resource-Item-ExtIEs} } OPTIONAL,

 ...

}

NZP-CSI-RS-Resource-Item-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

////Skip Unchanged Part

-- Served Cells NR IEs

ServedCellInformation-NR ::= SEQUENCE {

 nrPCI NRPCI,

 cellID NR-CGI,

 tac TAC,

 ranac RANAC OPTIONAL,

 broadcastPLMN BroadcastPLMNs,

 nrModeInfo NRModeInfo,

 measurementTimingConfiguration OCTET STRING,

 connectivitySupport Connectivity-Support,

 iE-Extensions ProtocolExtensionContainer { {ServedCellInformation-NR-ExtIEs} } OPTIONAL,

 ...

}

ServedCellInformation-NR-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 { ID id-BPLMN-ID-Info-NR CRITICALITY ignore EXTENSION BPLMN-ID-Info-NR PRESENCE optional }|

 { ID id-ConfiguredTACIndication CRITICALITY ignore EXTENSION ConfiguredTACIndication PRESENCE optional }|

 { ID id-SSB-PositionsInBurst CRITICALITY ignore EXTENSION SSB-PositionsInBurst PRESENCE optional }|

 { ID id-NRCellPRACHConfig CRITICALITY ignore EXTENSION NRCellPRACHConfig PRESENCE optional }|

 { ID id-NPN-Broadcast-Information CRITICALITY reject EXTENSION NPN-Broadcast-Information PRESENCE optional }|

 { ID id-CSI-RSTransmissionIndication CRITICALITY ignore EXTENSION CSI-RSTransmissionIndication PRESENCE optional }|

 { ID id-SFN-Offset CRITICALITY ignore EXTENSION SFN-Offset PRESENCE optional }|

 { ID id-Supported-MBS-FSA-ID-List CRITICALITY ignore EXTENSION Supported-MBS-FSA-ID-List PRESENCE optional }|

 { ID id-NR-U-ChannelInfo-List CRITICALITY ignore EXTENSION NR-U-ChannelInfo-List PRESENCE optional }|

 { ID id-Additional-Measurement-Timing-Configuration-List CRITICALITY ignore EXTENSION Additional-Measurement-Timing-Configuration-List PRESENCE optional }|

 { ID id-Redcap-Bcast-Information CRITICALITY ignore EXTENSION Redcap-Bcast-Information PRESENCE optional }|

 { ID id-eRedcap-Bcast-Information CRITICALITY ignore EXTENSION ERedcap-Bcast-Information PRESENCE optional }|

 { ID id-MobileIABCell CRITICALITY ignore EXTENSION MobileIABCell PRESENCE optional }|

 { ID id-XR-Bcast-Information CRITICALITY ignore EXTENSION XR-Bcast-Information PRESENCE optional }|

 { ID id-BarringExemptionforEmerCallInfo CRITICALITY ignore EXTENSION BarringExemptionforEmerCallInfo PRESENCE optional }|

 { ID id-NZP-CSI-RS-Resources-Config CRITICALITY ignore EXTENSION NZP-CSI-RS-Resources-Config PRESENCE optional },

 ...

}

**=============================Next change==============================**

9.3.7 Constant definitions

-- ASN1START

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

--

-- Constant definitions

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

////Skip Unchanged Part

id-ProcedureCode41-NotToBeUsed ProcedureCode ::= 41

id-scgFailureTransfer ProcedureCode ::= 42

id-f1CTrafficTransfer ProcedureCode ::= 43

id-iABTransportMigrationManagement ProcedureCode ::= 44

id-iABTransportMigrationModification ProcedureCode ::= 45

id-iABResourceCoordination ProcedureCode ::= 46

id-retrieveUEContextConfirm ProcedureCode ::= 47

id-cPCCancel ProcedureCode ::= 48

id-partialUEContextTransfer ProcedureCode ::= 49

id-rachIndication ProcedureCode ::= 50

id-dataCollectionReportingInitiation ProcedureCode ::= 51

id-dataCollectionReporting ProcedureCode ::= 52

id-cLI-MeasurementReporting ProcedureCode ::= FFS

////Skip Unchanged Part

maxnoofPSCellsinCPAC INTEGER ::= 8

maxnoofCPACexecutioncond INTEGER ::= 2

maxnoofLBTFailureInformation INTEGER ::= 64

maxnoofCellsTrajectoryPredict INTEGER ::= 16

maxnoofCellsTrajectory INTEGER ::= 16

maxFailedCellMeasObjects INTEGER ::= 124

maxFailedMeasPerNode INTEGER ::= 124

maxnoofUEReports INTEGER ::= 16

maxnoofCandidateRelayUEs INTEGER ::= 32

maxnoofCAGforMDT INTEGER ::= 256

maxnoofMDTSNPNs INTEGER ::= 16

maxnoofSecurityConfigurations INTEGER ::= 8

maxnoofRSPPQoSFlows INTEGER ::= 2048

maxnoofNZP-CSI-RS-ResourcesPerSet INTEGER ::= 64

////Skip Unchanged Part

id-SLPositioning-Ranging-Services-Info ProtocolIE-ID ::= 464

id-XR-Bcast-Information ProtocolIE-ID ::= 465

id-PDUSessionsListToBeReleased-UPError ProtocolIE-ID ::= 466

id-MaximumDataBurstVolume  ProtocolIE-ID ::= 467

id-CPAC-Preparation-Type ProtocolIE-ID ::= 468

id-UserPlaneFailureIndication ProtocolIE-ID ::= 469

id-MN-only-MDT-collection ProtocolIE-ID ::= 470

id-BarringExemptionforEmerCallInfo ProtocolIE-ID ::= 471

id-Transmission-Bandwidth-asymmetric ProtocolIE-ID ::= 472

id-SRSPositioningConfigOrActivationRequest ProtocolIE-ID ::= 473

id-NRPPaPositioningInformation ProtocolIE-ID ::= 474

id-CLI-MeasurementResult-List ProtocolIE-ID ::= FFS

id-SBFD-Configuration ProtocolIE-ID ::= FFS

id-NZP-CSI-RS-Resources-Config ProtocolIE-ID ::= FFS

END

-- ASN1STOP

**=============================Next change==============================**