**3GPP TSG RAN meeting #97eRP-222560**

**Electronic Meeting, September 12-16, 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.473** | **CR** | **1025** | **rev** | **2** | **Current version:** | 17.1.0 |  |
|  | | | | | | | | |
| *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:*** | Introduction of uplink GapFR2 [ULGapFR2] | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | Huawei, Orange, Deutsche Telekom, Nokia, Nokia Shanghai Bell | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2022-09-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | In TS 38.331, the *ul-GapFR2-Config-r17* IE is introduced in RRCReconfiguration message (as first agreed in R2-2204230), which is used to indicate the FR2 UL gap configuration to UE.  UL-GapFR2-Config-r17 ::= SEQUENCE {  gapOffset-r17 INTEGER (0..159),  ugl-r17 ENUMERATED {ms0dot125, ms0dot25, ms0dot5, ms1},  ugrp-r17 ENUMERATED {ms5, ms20, ms40, ms160},  refFR2-ServCellAsyncCA-r17 ServCellIndex OPTIONAL -- Cond AsyncCA  }  In addition, in MR-DC case, as specified in TS 38.331 below,   * In EN-DC and NGEN-DC, the SN decides and configures the FR2 UL gap pattern. In NE-DC, the MN decides and configures the FR2 UL gap pattern. In NR-DC without FR2-FR2 band combination, the network entity which is configured with FR2 serving cell(s) decides and configures the FR2 UL gap pattern.   This is to support one objective in RAN4 lead WI in RP-213666: UL gaps for self-calibration and monitoring. The main use case of the UL gap is to let UE detect whether human body is close to the Tx antennas during UL gaps, thus avoiding any unnecessary P-MPR.  In CU/DU split scenario, it should be the DU that decides the UL-GapFR2-Config as octet string, and signal to the CU. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Add the *ul-GapFR2-Config* IE in the DU to CU RRC Information.     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).  The impact can be considered isolated because the change only affects the DU to CU RRC information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The *ul-GapFR2-Config* feature is not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.3.1.2, 8.3.4,2, 9.3.1.26, 9.4.5, 9.4.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Rev0: R3-224873  Rev1: R3-225107  Update the cover page, and minor updates of the unchanged procedure texts in section 8.3.1.2.  Rev2: RP-222560  Update the cover page as follows, and submit to the RAN#97 meeting, to replace the R3-225107 of RP-222182 as R3-225107 was a cat.F CR to TS 38.473 for closed Rel-17 WI NR\_RF\_FR2\_req\_enh2-Core although TS 38.473 was never impacted by this WI.  - use RAN meeting header and Tdoc number  - update the title  - change rev to 2  - correct the cat. to B  - correct the WI code to TEI17  - leave source to WG empty | | | | | | | | |

|  |
| --- |
| **Change Begins** |

**<Unchanged Text Omitted>**

### 8.3.1 UE Context Setup

#### 8.3.1.1 General

The purpose of the UE Context Setup procedure is to establish the UE Context including, among others, SRB,DRB, BH RLC channel, Uu Relay RLC channel, PC5 Relay RLC channel, and SL DRB configuration. The procedure uses UE-associated signalling.

#### 8.3.1.2 Successful Operation



Figure 8.3.1.2-1: UE Context Setup Request procedure: Successful Operation

**<Unchanged Text Omitted>**

If the *Multicast MBS Session Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message the gNB-DU shall, if supported, store and use the information for configuring MBS Session Resources, if applicable.

If the *UE Multicast MRB To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, take it into account for configuring MBS Session Resources, if applicable. And if the *MBS PTP Retransmission Tunnel Required* IE is included in the *UE Multicast MRB to Be Setup Item IEs* IE, the gNB-DU shall, if supported trigger the establishment of the MBS PTP Retransmission F1-U tunnel.

If the *ul-GapFR2-Config* IE is contained in the *DU to CU RRC Information* IE that is included in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall, if supported, use it as described in TS 38.331 [8].

**<Unchanged Text Omitted>**

### 8.3.4 UE Context Modification (gNB-CU initiated)

#### 8.3.4.1 General

The purpose of the UE Context Modification procedure is to modify the established UE Context, e.g., establishing, modifying and releasing radio resources or sidelink resources. This procedure is also used to command the gNB-DU to stop data transmission for the UE for mobility (see TS 38.401 [4]). The procedure uses UE-associated signalling.

#### 8.3.4.2 Successful Operation



Figure 8.3.4.2-1: UE Context Modification procedure. Successful operation

**<Unchanged Text Omitted>**

If the *UE* *Multicast MRB To Be Setup Item* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account for configuring MBS Session Resources, if applicable. And if the *MBS PTP Retransmission Tunnel Required* IE is included in the *UE Multicast MRB to Be Setup Item IEs* IE, the gNB-DU shall, if supported trigger the establishment of the MBS PTP Retransmission F1-U tunnel.

If the *Management Based MDT PLMN Modification* *List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, overwrite any previously stored Management Based MDT PLMN List information in the UE context and use the received information to determine subsequent selection of the UE for management based MDT defined in TS 32.422 [29].

If the *ul-GapFR2-Config* IE is contained in the *DU to CU RRC Information* IE that is included in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall, if supported, use it as described in TS 38.331 [8].

**<Unchanged Text Omitted>**

#### 9.3.1.26 DU to CU RRC Information

This IE contains the RRC Information that are sent from the gNB-DU to the gNB-CU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| CellGroupConfig | M |  | OCTET STRING | CellGroupConfig, as defined in TS 38.331 [8]. |  |  |
| MeasGapConfig | O |  | OCTET STRING | MeasGapConfig as defined in TS 38.331 [8].  For EN-DC/NGEN-DC operation, includes the gap for FR2, as requested by the gNB-CU via MeasConfig IE.  For NG-RAN,NE-DC and MN for NR-NR DC, includes the gap(s) for FR1 and/or FR2, as requested by the gNB-CU via MeasConfig IE and according to the requested gap type (per-UE or per-FR). |  |  |
| Requested P-MaxFR1 | O |  | OCTET STRING | requestedP-MaxFR1, as defined in TS 38.331 [8].  For EN-DC, NGEN-DC and NR-DC operation, this IE should be included. |  |  |
| DRX Long Cycle Start Offset | O |  | INTEGER (0..10239) | Identical to the value of the drx-LongCycleStartOffset IE within the DRX-Config as defined in TS 38.331 [8].  This field is not used in NR-DC. |  |  |
| Selected BandCombinationIndex | O |  | OCTET STRING | BandCombinationIndex, as defined in TS 38.331 [8].  For (NG)EN-DC and NR DC operation, this IE should be included so that gNB-CU is informed of the selected Band Combination; if this IE is included, the gNB-CU uses this information to deduce the selected band. | YES | ignore |
| Selected FeatureSetEntryIndex | O |  | OCTET STRING | FeatureSetEntryIndex, as defined in TS 38.331 [8].  For (NG)EN-DC and NR DC operation, this IE should be included so that gNB-CU is informed of the selected FeatureSet. | YES | ignore |
| Ph-InfoSCG | O |  | OCTET STRING | PH-TypeListSCG, as defined in TS 38.331 [8].For MR-DC, this IE should be included so that gNB-CU is informed of the Power Headroom type for each serving cell in SN. | Yes | ignore |
| Requested BandCombinationIndex | O |  | OCTET STRING | BandCombinationIndex, as defined in TS 38.331 [8].  This IE is used for the gNB-DU to request a new Band Combination. | YES | ignore |
| Requested FeatureSetEntryIndex | O |  | OCTET STRING | FeatureSetEntryIndex, as defined in TS 38.331 [8].  This IE is used for the gNB-DU to request a new Feature Set. | YES | ignore |
| DRX Config | O |  | OCTET STRING | DRX-Config, as defined in TS 38.331 [8].  This field is only used in NR-DC. | YES | ignore |
| PDCCH BlindDetectionSCG | O |  | OCTET STRING | pdcch-BlindDetectionSCG, as defined in TS 38.331 [8]. This IE is used between the MgNB-DU and the MgNB-CU. | YES | ignore |
| Requested PDCCH BlindDetectionSCG | O |  | OCTET STRING | requestedPDCCH-BlindDetectionSCG, as defined in TS 38.331 [8]. This IE is used between the SgNB-DU and the SgNB-CU. | YES | ignore |
| Ph-InfoMCG | O |  | OCTET STRING | PH-TypeListMCG, as defined in TS 38.331 [8]. For MR-DC, this IE should be included so that gNB-CU is informed of the Power Headroom type for each serving cell in MCG. | YES | ignore |
| MeasGapSharingConfig | O |  | OCTET STRING | MeasGapSharingConfig as defined in TS 38.331 [8]. | YES | ignore |
| SL-PHY-MAC-RLC-Config | O |  | OCTET STRING | SL-PHY-MAC-RLC-Config as defined in TS 38.331 [8]. | YES | ignore |
| SL-ConfigDedicatedEUTRA-Info | O |  | OCTET STRING | SL-ConfigDedicatedEUTRA-Info as defined in TS 38.331 [8]. | YES | ignore |
| Requested P-MaxFR2 | O |  | OCTET STRING | RequestedP-MaxFR2, as defined in TS 38.331 [8].  For NR-DC operation, this IE should be included. | YES | ignore |
| SDT-MACPHY-Config | O |  | OCTET STRING | SDT-MACPHY-Config, as defined in TS 38.331 [8]. | YES | ignore |
| MUSIM-GapConfig | O |  | OCTET STRING | MUSIM-GapConfig as defined in TS 38.331 [8]. | YES | ignore |
| SL-RLC-ChannelToAddModList | O |  | OCTET STRING | sl-RLC-ChannelToAddModList-r17, as defined in TS 38.331 [8] | YES | ignore |
| ul-GapFR2-Config | O |  | OCTET STRING | ul-GapFR2-Config-r17, as specifed in TS 38.331 [8]. | YES | ignore |

**<Unchanged Text Omitted>**

### 9.4.5 Information Element Definitions

-- ASN1START

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

--

-- Information Element Definitions

--

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

F1AP-IEs {

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

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

**<Unchanged Text Omitted>**

id-SIB17-message,

id-MUSIM-GapConfig,

id-SIB20-message,

id-pathPower,

id-DU-RX-MT-RX-Extend,

id-DU-TX-MT-TX-Extend,

id-DU-RX-MT-TX-Extend,

id-DU-TX-MT-RX-Extend,

id-TAINSAGSupportList,

id-SL-RLC-ChannelToAddModList,

id-SIB15-message,

id-UL-GapFR2-Config,

maxNRARFCN,

maxnoofErrors,

maxnoofBPLMNs,

**<Unchanged Text Omitted>**

DUtoCURRCInformation ::= SEQUENCE {

cellGroupConfig CellGroupConfig,

measGapConfig MeasGapConfig OPTIONAL,

requestedP-MaxFR1 OCTET STRING OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { DUtoCURRCInformation-ExtIEs} } OPTIONAL,

...

}

DUtoCURRCInformation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

{ ID id-DRX-LongCycleStartOffset CRITICALITY ignore EXTENSION DRX-LongCycleStartOffset PRESENCE optional }|

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

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

{ ID id-Ph-InfoSCG CRITICALITY ignore EXTENSION Ph-InfoSCG PRESENCE optional }|

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

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

{ ID id-DRX-Config CRITICALITY ignore EXTENSION DRX-Config PRESENCE optional }|

{ ID id-PDCCH-BlindDetectionSCG CRITICALITY ignore EXTENSION PDCCH-BlindDetectionSCG PRESENCE optional }|

{ ID id-Requested-PDCCH-BlindDetectionSCG CRITICALITY ignore EXTENSION Requested-PDCCH-BlindDetectionSCG PRESENCE optional }|

{ ID id-Ph-InfoMCG CRITICALITY ignore EXTENSION Ph-InfoMCG PRESENCE optional }|

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

{ ID id-SL-PHY-MAC-RLC-Config CRITICALITY ignore EXTENSION SL-PHY-MAC-RLC-Config PRESENCE optional }|

{ ID id-SL-ConfigDedicatedEUTRA-Info CRITICALITY ignore EXTENSION SL-ConfigDedicatedEUTRA-Info PRESENCE optional }|

{ ID id-RequestedP-MaxFR2 CRITICALITY ignore EXTENSION RequestedP-MaxFR2 PRESENCE optional }|

{ ID id-SDT-MACPHY-Config CRITICALITY ignore EXTENSION SDT-MACPHY-Config PRESENCE optional }|

{ ID id-MUSIM-GapConfig CRITICALITY ignore EXTENSION MUSIM-GapConfig PRESENCE optional }|

{ ID id-SL-RLC-ChannelToAddModList CRITICALITY ignore EXTENSION SL-RLC-ChannelToAddModList PRESENCE optional }|

{ ID id-UL-GapFR2-Config CRITICALITY ignore EXTENSION UL-GapFR2-Config PRESENCE optional },

...

}

**<Unchanged Text Omitted>**

ULConfiguration ::= SEQUENCE {

uLUEConfiguration ULUEConfiguration,

iE-Extensions ProtocolExtensionContainer { { ULConfigurationExtIEs } } OPTIONAL,

...

}

ULConfigurationExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

UL-GapFR2-Config ::= OCTET STRING

UL-RTOA-Measurement ::= SEQUENCE {

uL-RTOA-MeasurementItem UL-RTOA-MeasurementItem,

additionalPath-List AdditionalPath-List OPTIONAL,

iE-Extensions ProtocolExtensionContainer { { UL-RTOA-Measurement-ExtIEs } } OPTIONAL

}

UL-RTOA-Measurement-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

...

}

**<Unchanged Text Omitted>**

### 9.4.7 Constant Definitions

-- ASN1START

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

--

-- Constant definitions

--

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

**<Unchanged Text Omitted>**

id-ManagementBasedMDTPLMNModificationList ProtocolIE-ID ::= 647

id-SIB15-message ProtocolIE-ID ::= 648

id-ActivationRequestType ProtocolIE-ID ::= 649

id-PosMeasGapPreConfigList ProtocolIE-ID ::= 650

id-UL-GapFR2-Config ProtocolIE-ID ::= aaa

**<Unchanged Text Omitted>**

|  |
| --- |
| **Change Ends** |