3GPP TSG-RAN WG3 Meeting #129 R3-255788

Bengaluru, India, 25th – 29th August, 2025

Title: (TP for AI/ML BLCR to TS 38.473) Mechanism to cancel previously signalled AI/ML-based CCO information

Agenda Item: 11.3

Source: Huawei, Jio Platforms, Vodafone, Deutsche Telekom, Orange, Ericsson, Samsung, Ofinno, CATT, ZTE, NEC, Lenovo, Rakuten

Document for: Discussion

Introduction

This is a TP for the AI/ML BLCR to TS 38.473 [1] reflecting the F1AP impact of the following:

**Proposal 3: Capture in TPs for F1AP and XnAP BLCRs that cancel codepoint is introduced in the F1AP’s *Predicted CCO issue* IE (included in the *Predicted CCO Assistance Information* IE) and in the *Future Coverage Modification Cause* IE (included in the *Future Coverage Modification Notification* IE), as well as in the XnAP’s *Predicted Coverage Modification Cause* IE (included in the *Future Coverage Modification List* IE).**

2. Reference

1. R3-255046, (BL CR to 38.473) Support of enhancements on AI/ML for NG-RAN, Ericsson (Rapporteur), ZTE, NEC, Nokia, Huawei, Ofinno

# TP for AIML BLCR for TS38.473 (based on R3-255046)

<<<<<<<<<<<<<<<<<<<< Start of Change >>>>>>>>>>>>>>>>>>>>

8.2.4 gNB-DU Configuration Update

8.2.4.1 General

The purpose of the gNB-DU Configuration Update procedure is to update application level configuration data needed for the gNB-DU and the gNB-CU to interoperate correctly on the F1 interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non-UE associated signalling.

NOTE: Update of application level configuration data also applies between the gNB-DU and the gNB-CU in case the DU does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [7]. How to use this information when this option is used is not explicitly specified.

8.2.4.2 Successful Operation

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**Figure 8.2.4.2-1: gNB-DU Configuration Update procedure: Successful Operation**

The gNB-DU initiates the procedure by sending a GNB-DU CONFIGURATION UPDATE message to the gNB-CU including an appropriate set of updated configuration data that it has just taken into operational use. The gNB-CU responds with GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. If an information element is not included in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall interpret that the corresponding configuration data is not changed and shall continue to operate the F1-C interface with the existing related configuration data.

<<<<SKIP UNRELATED PART>>>>

If the *Coverage Modification Notification* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, take it into account for Coverage and Capacity Optimization and network energy saving. If the *Coverage Modification Cause* IE is set to the "network energy saving", gNB-CU may consider those deactivated SSB beams are due to network energy saving.

If the *Cells for SON* IE is present in the GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-DU may store or update this information and behaves as follows:

- For each served cell indicated by the *NR CGI* IE included within the *Cells for SON Item* IE, the gNB-DU may adjust the PRACH configuration of this served cell.

- If the *Neighbour NR Cells for SON List* IE is present in the *Cells for SON Item* IE, the gNB-DU may take the PRACH configuration of neighbour cells included in the *Neighbour NR Cells for SON List* IE into consideration when adjusting the PRACH configuration of the served cell.

If the *RedCap Broadcast Information* IE is contained in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU may store and use this information to determine a suitable target in case of subsequent outgoing mobility involving RedCap UEs.

If the *eRedCap Broadcast Information* IE is contained in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU may store and use this information to determine a suitable target in case of subsequent outgoing mobility involving eRedCap UEs.

If the *TAI NSAG Support List* IE is included in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, use this information as specified in TS 23.501 [21].

If the *gNB-DU Name* IE is included in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-DU. If the *Extended gNB-DU Name* IE is included in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-DU and shall ignore the *gNB-DU Name* IE if also included.

If the *RRC Terminating IAB-Donor Related Info* IE is included in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, consider that the BAP address indicated by the *Mobile IAB-MT BAP Address* IE is assigned by the gNB-CU of the RRC-terminating IAB-donor indicated by the *RRC Terminating IAB-Donor gNB-ID* IE, and it shall use this BAP address and gNB ID for the subsequent IAB Transport Migration Management procedure towards the RRC-terminating IAB-donor of the mobile IAB-node as needed, as specified in TS 38.423 [28].

If the GNB-DU CONFIGURATION UPDATE message contains the *Mobile IAB-MT User Location Information* IE, the gNB-CU shall, if supported, take it into account when reporting UE location information to the AMF for a UE served by the mobile IAB-node.

If the *XR Broadcast Information* IE is included in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, consider the indicated cell does not allow 2Rx XR UEs in case of subsequent outgoing mobility involving XR UEs.

If the *Barring Exemption for Emergency Call Information* IE is included in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU may store the information and consider the indicated cell allows emergency bearer services for UEs who would otherwise consider the cell as barred as specified in TS 38.304 [24].

If the *Future Coverage Modification Notification* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, take it into account for Coverage and Capacity Optimization.

If the *Future Coverage Modification Notification* IE is contained in the GNB-DU CONFIGURATION UPDATE message and if the *Future Coverage Modification Cause* IE is set to “cancel”, the gNB-CU shall, if supported, consider it as a notification that the gNB-DU has cancelled any previously received future coverage states associated to the same list of cells and beams listed in the *Future Coverage Modification List* IE that have not been applied.

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

### 8.2.5 gNB-CU Configuration Update

#### 8.2.5.1 General

The purpose of the gNB-CU Configuration Update procedure is to update application level configuration data needed for the gNB-DU and gNB-CU to interoperate correctly on the F1 interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non-UE associated signalling.

#### 8.2.5.2 Successful Operation



Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

The gNB-CU initiates the procedure by sending a GNB-CU CONFIGURATION UPDATE message including the appropriate updated configuration data to the gNB-DU. The gNB-DU responds with a GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. If an information element is not included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall interpret that the corresponding configuration data is not changed and shall continue to operate the F1-C interface with the existing related configuration data.

<<<<SKIP UNRELATED PART>>>>

If the *CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message, and the *NR CGI* IE contained in the *Affected Cells and Beams* IE is served by the gNB-DU, the gNB-DU may use it to determine a new cell and/or beam configuration.

If the *CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message and the *NR CGI* IE contained in the *Affected Cells and Beams* IE is not served by the gNB-DU, the gNB-DU may use it to adjust coverage of its cells.If the *CCO issue detection* IE set to "network energy saving" is included in the *CCO Assistance Information* IE, the gNB-DU may consider the indicated SSB beams by the *Affected Cells and Beam* IE are deactivated due to network energy saving.

If the *Cells for SON* IE is present in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store or update this information and it behaves as follows:

- For each served cell indicated by the *NR CGI* IE included within the *Cells for SON Item* IE, the gNB-DU may adjust the PRACH configuration of this served cell.

- If the *Neighbour NR Cells for SON List* IE is present in the *Cells for SON Item* IE, the gNB-DU may take the PRACH configuration of neighbour cells included in the *Neighbour NR Cells for SON List* IE into consideration when adjusting the PRACH configuration of the served cell.

If the *gNB-CU Name* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU. If the *Extended gNB-CU Name* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU and shall ignore the *gNB-CU Name* IE if also included.

If the *Mobile IAB Barred* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, consider it as an indication of whether the cell allows mobile IAB-node access.

If the *Predicted CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message, and the *NR CGI* IE contained in the *Predicted Affected Cells and Beams* IE is served by the gNB-DU, the gNB-DU may use it to determine a future cell and/or beam configuration.

If the *Predicted CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message and the *NR CGI* IE contained in the *Predicted Affected Cells and Beams* IE is not served by the gNB-DU, the gNB-DU may use it to adjust the coverage of its cells.

If the *Neighbour Future Coverage Modification Notification* IE is contained in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, take it into account for Coverage and Capacity Optimization.

If the *Predicted CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message and if the *Predicted CCO issue* IE is set to “cancel”, the gNB-DU shall discard any *Predicted CCO Assistance Information* IE previously received together with the same list of cells and beams included in the *Predicted Affected Cells and Beams* IE, as well as any future coverage states for the same list of cells and beams that have not been activated.

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

8.2.5.4 Abnormal Conditions

If the *Predicted CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message, and if:

 - the *Predicted CCO issue* IE is set to “cancel”, and

 - the *Predicted Affected Cells and Beams* IE is not present,

then the gNB-DU shall discard the received *Predicted CCO Assistance Information* IE.

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

#### 9.3.1.A Predicted CCO Assistance Information

This IE provides predicted assistance information for the future Coverage and Capacity Optimisation (CCO) actions for predicted CCO issues.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| --- | --- | --- | --- | --- |
| Predicted CCO issue  | O |  | ENUMERATED (coverage, cell edge capacity, cancel, ...) | Indicates the type of predicted CCO issue or that a previously sent predicted CCO assistance information is cancelled. |
| Predicted Affected Cells and Beams | O |  | Affected Cells and Beams9.3.1.212 |  |
| Time for Predicted CCO Issue | O | INTEGER (1..60, ...) |  | Indicates the time when the predicted CCO issue will happen from the time of receiving this information, in seconds. |

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#### 9.3.1.B Future Coverage Modification Notification

This IE includes a list of cells and/or SS/PBCH block indexes with the corresponding future coverage configuration selected by a gNB-DU.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| --- | --- | --- | --- | --- |
| **Future Coverage Modification Notification List** |  | *1* |  |  |
|  **>Future Coverage Modification Notification Item** |  | 1..<maxCellingNBDU> |  |  |
|  >>NR CGI | M |  | 9.3.1.12 |  |
|  >>Future Cell Coverage State | M |  | INTEGER (0..63, ...) | Value ‘0’ indicates that the cell will be inactive. Other values indicate that the cell will be active and also indicate the future coverage configuration of the concerned cell. The IE is ignored if the Future Coverage Modification Cause is set to “cancel”. |
|  **>>Future SSB Modification Notification List** |  | *0..1* |  |  |
|  **>>>Future SSB Modification Notification Item** |  | *1..<maxnoofSSBAreas>* |  |  |
|  >>>>SSB Index | M |  | INTEGER (0..63) |  |
|  >>>>Future SSB Coverage State | M |  | INTEGER (0..15, ...) | Value ‘0’ indicates that the SSB beam will be inactive. Other values indicate that the SSB beams will be active and also indicate the future coverage configuration of the concerned SSB beams. The IE is ignored if the Future Coverage Modification Cause is set to “cancel”. |
|  >>Time for Future Coverage Modification | O |  | INTEGER (1..60, ...) | Indicates the time when the Future Cell Coverage State(s) and/or the Future SSB Coverage State(s) will be applied by the gNB-DU relative to the time of receiving this information, in seconds. The IE is not included if the Future Coverage Modification Cause is set to “cancel”  |
| >>Future Coverage Modification Cause | O |  | ENUMERATED(coverage, cell edge capacity, cancel, …) |  |

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### 9.4.5 Information Element Definitions

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Future-Coverage-Modification-Notification ::= SEQUENCE {

 future-coverage-Modification-List Future-Coverage-Modification-List,

 iE-Extensions ProtocolExtensionContainer { { Future-Coverage-Modification-Notification-ExtIEs} } OPTIONAL,

 ...

}

Future-Coverage-Modification-Notification-ExtIEs F1AP-PROTOCOL-EXTENSION ::={

 ...

}

Future-Coverage-Modification-List ::= SEQUENCE (SIZE (1..maxCellingNBDU)) OF Future-Coverage-Modification-Item

Future-Coverage-Modification-Item ::= SEQUENCE {

 nRCGI NRCGI,

 futurecellCoverageState FutureCellCoverageState,

 futureSSBCoverageModificationList FutureSSBCoverageModification-List OPTIONAL,

 timeforFutureCoverageModification TimeforFutureCoverageModification OPTIONAL,

 futureCoverageModificationCause Predicted-CCO-issue-detection OPTIONAL,

 iE-Extension ProtocolExtensionContainer { { Future-Coverage-Modification-Item-ExtIEs} } OPTIONAL,

 ...

}

Future-Coverage-Modification-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

FutureCellCoverageState ::= INTEGER (0..63, ...)

FutureSSBCoverageModification-List ::= SEQUENCE (SIZE (1..maxnoofSSBAreas)) OF FutureSSBCoverageModification-Item

FutureSSBCoverageModification-Item::= SEQUENCE {

 sSBIndex INTEGER(0..63),

 futureSSBCoverageState FutureSSBCoverageState,

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

...

}

FutureSSBCoverageModification-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

FutureSSBCoverageState ::= INTEGER (0..15, ...)

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Predicted-CCO-Assistance-Information ::= SEQUENCE {

 predicted-CCO-issue-detection Predicted-CCO-issue-detection OPTIONAL,

 predictedAffectedCellsAndBeams-List AffectedCellsAndBeams-List OPTIONAL,

 timeforPredictedCCOIssue TimeforPredictedCCOIssue, OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { Predicted-CCO-Assistance-Information-ExtIEs} } OPTIONAL,

 ...

}

Predicted-CCO-Assistance-Information-ExtIEs F1AP-PROTOCOL-EXTENSION ::={

 ...

}

Predicted-CCO-issue-detection ::= ENUMERATED {coverage, cell-edge-capacity, cancel, ...}

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