**3GPP TSG-RAN3 Meeting #129bisR3-257243**

**Prague, CZ, 13-17 October, 2025**

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.423** | **CR** | **1541** | **rev** | **1** | **Current version:** | **19.0.0** |  |
|  |
| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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|  |
| ***Title:***  | Miscellaneous correction to XnAP - AI/ML for NG-RAN |
|  |  |
| ***Source to WG:*** |  ZTE Corporation |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_AIML\_NGRAN\_enh-Core |  | ***Date:*** | 2025-10-13 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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:*** | Following is miscellaneous issues detected in XnAP:1. The current semantic description of *UE Performance Collection Configuration* IE only includes the collection condition “after successful handover”. In Rel-19, “successful S-NG-RAN node addition” also is the collection condition for NR-DC scenario. Therefore, it is proposed to update the semantic description of *UE Performance Collection Configuration* IE.
2. The *Future Coverage Modification List* IE contains both mandatory (cell-level) and optional (beam-level) information. However, in the procedure for the “cancel” operation, the handling of these IEs is not consistently described.
3. The procedural text for the “cancel” operation should consistently refer to TS 38.300.
4. Modify the terminating condition for data collection to only include NR-DC case.
5. Modify the cell ID in the *Furture Converage Modification Item* IE
 |
|  |  |
| ***Summary of change:*** | * Update the semantic description of *UE Performance Collection Configuration* IE.
* Clarify the procedural text to ensure consistency between the mandatory Global NG-RAN Cell Identity IE and the optional Future SSB Coverage Modification List IE when describing the “cancel” operation.
* Update the procedural text of the “cancel” operation so that it explicitly references TS 38.300.
* Modify the terminating condition for data collection to only include NR-DC case to “NG-RAN node2, configured as the SN node for the UE, is released.”
* Modify the cell ID in the *Furture Converage Modification Item* IE to *NR CGI* IE, with ASN.1 change.
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| ***Consequences if not approved:*** | XnAP support for AI/ML in NG-RAN still has unresolved issues. |
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| ***Clauses affected:*** | 8.4.2.2, 8.4.13, 9.1.3.4, 9.2.3.186, 9.3.5 |
|  |  |
|  | **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:*** |  |

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### 8.4.2 NG-RAN node Configuration Update

#### 8.4.2.1 General

The purpose of the NG-RAN node Configuration Update procedure is to update application level configuration data needed for two NG-RAN nodes to interoperate correctly over the Xn-C interface.

NOTE: Update of application level configuration data also applies between two NG-RAN nodes in case the SN (i.e. the gNB) does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [8]. How to use this information when this option is used is not explicitly specified.

The procedure uses non UE-associated signalling.

#### 8.4.2.2 Successful Operation



Figure 8.4.2.2-1: NG-RAN node Configuration Update, successful operation

The NG-RAN node1 initiates the procedure by sending the NG-RAN NODE CONFIGURATION UPDATE message to a peer NG-RAN node2.

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**Update of Future Cell Coverage:**

If the *Future Coverage Modification List* IE is present in the NG-RAN NODE CONFIGURATION UPDATE message, the NG-RAN node2 may use the information to identify the future cell deployment configuration to be enabled by the NG-RAN node1 at a time indicated by *Time for Future Coverage State* IE and for configuring mobility towards the cell(s) indicated by the *Global NG-RAN Cell Identity* IE, as described in TS 38.300 [9].

If the *Future SSB Coverage Modification List* IE is present in the *Future Coverage Modification List* IE, the NG-RAN node2 may use the information to identify the future SSB beam deployment configuration to be enabled by the NG-RAN node1 at a time indicated by *Time for Future Coverage State* IE and for configuring the mobility towards the beam(s) indicated by the *SSB Index* IE, as described in TS 38.300 [9].

If the *Predicted Coverage Modification Cause* IE set to "coverage" or "cell edge capacity" is present in the NG-RAN NODE CONFIGURATION UPDATE message, the NG-RAN node2 may use the information for deducing the CCO issue predicted in NG-RAN node1 and for configuring coverage state of its served cell(s).

If the *Predicted Coverage Modification Cause* IE set to "cancel" is contained in the NG-RAN NODE CONFIGURATION UPDATE message, the NG-RAN node2 shall, if supported, consider it as a notification of cancellation of the future coverage modifications associated to the cell(s) and optionally beam(s) listed in the *Future Coverage Modification List* IE, as described in TS 38.300 [9].

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### 8.4.13 Data Collection Reporting Initiation

#### 8.4.13.1 General

This procedure is used by an NG-RAN node to request from another NG-RAN node the reporting of information to support, e.g., AI/ML in NG-RAN.

The procedure uses non UE-associated signalling.

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The result of the UE trajectory collection is reported at the next available DATA COLLECTION UPDATE message.

If the *Registration Request for Data Collection* IE is set to "start" in the DATA COLLECTION REQUEST message and one or more of the UE performance metrics are requested, the *UE Performance Collection Configuration* IE shall be included.The NG-RAN node2 shall take the *UE Performance Collection Configuration* IE into account for the configuration of UE performance collection and reporting. NG-RAN node2 shall terminate the collection when at least one of the following conditions is fulfilled:

- the time since UE was successfully handed over to NG-RAN node2 is equal to the value of the *Collection Time Duration for UE Performance* IE;

- the time since SN addition successfully completed is equal to the value of the *Collection Time Duration for UE Performance* IE;

- UE moves to RRC\_INACTIVE or RRC\_IDLE state;

- UE is handed over to another cell;

- the NG-RAN node2, configured as the SN for the UE, is released.

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#### 9.1.3.4 NG-RAN NODE CONFIGURATION UPDATE

This message is sent by a NG-RAN node to a neighbouring NG-RAN node to transfer updated information for an Xn-C interface instance.

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

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| Message Type | M |  | 9.2.3.1 |  | YES | reject |
| TAI Support List | O |  | 9.2.3.20 | List of supported TAs and associated characteristics. | GLOBAL | reject |
| CHOICE *Initiating NodeType* | M |  |  |  | YES | ignore |
| *>gNB* |  |  |  |  |  |  |
| >>Served Cells To Update NR | O |  | 9.2.2.15 |  | YES | ignore |
| >>Cell Assistance Information NR | O |  | 9.2.2.17 |  | YES | ignore |
| >>Cell Assistance Information E-UTRA | O |  | 9.2.2.43 |  | YES | ignore |
| >>Served Cell Specific Info Request | O |  | 9.2.2.102 |  | YES | ignore |
| *>ng-eNB* |  |  |  |  |  |  |
| >>Served Cells to Update E-UTRA | O |  | 9.2.2.16 |  | YES | ignore |
| >>Cell Assistance Information NR | O |  | 9.2.2.17 |  | YES | ignore |
| >>Cell Assistance Information E-UTRA | O |  | 9.2.2.43 |  | YES | ignore |
| **TNLA To Add List** |  | *0..1* |  |  | YES | ignore |
| **>TNLA To Add Item** |  | *1..<maxnoofTNLAssociations>* |  |  | – |  |
| >>TNLA Transport Layer Information | M |  | CP Transport Layer Information9.2.3.31 | CP Transport Layer Information of NG-RAN node1 | – |  |
| >>TNL Association Usage | M |  | 9.2.3.84 |  | – |  |
| **TNLA To Update List**  |  | *0..1* |  |  | YES | ignore |
| **>TNLA To Update Item** |  | *1..<maxnoofTNLAssociations>* |  |  | – |  |
| >>TNLA Transport Layer Information | M |  | CP Transport Layer Information9.2.3.31 | CP Transport Layer Information of NG-RAN node1 | – |  |
| >>TNL Association Usage | O |  | 9.2.3.84 |  | – |  |
| **TNLA To Remove List** |  | *0..1* |  |  | YES | ignore |
| **>TNLA To Remove Item** |  | *1..<maxnoofTNLAssociations>* |  |  | – |  |
| >>TNLA Transport Layer Information | M |  | CP Transport Layer Information9.2.3.31 | CP Transport Layer Information of NG-RAN node1 | – |  |
| Global NG-RAN Node ID | O |  | 9.2.2.3 |  | YES | reject |
| AMF Region Information To Add | O |  | AMF Region Information9.2.3.83 | List of all added AMF Regions to which the NG-RAN node belongs. | YES | reject |
| AMF Region Information To Delete | O |  | AMF Region Information9.2.3.83 | List of all deleted AMF Regions to which the NG-RAN node belongs. | YES | reject |
| Interface Instance Indication | O |  | 9.2.2.39 |  | YES | reject |
| TNL Configuration Info | O |  | 9.2.3.96 |  | YES | ignore |
| **Coverage Modification List** |  | *0 .. 1* |  | List of cells with modified coverage. | GLOBAL | reject |
| **>Coverage Modification Item** |  | *0 .. <maxnoofCellsinNG-RAN node>* |  |  | – |  |
| >>Global NG-RAN Cell Identity | M |  | Global Cell Identity9.2.2.73 | Global Cell Identity of the cell to be modified. In this version of the specification, only a NG-RAN cell identifier can be included. | – |  |
| >>Cell Coverage State | M |  | INTEGER (0..63, …) | Value ‘0’ indicates that the cell is inactive. Other values Indicates that the cell is active and also indicates the coverage configuration of the concerned cell. | – |  |
| >>Cell Deployment Status Indicator | O |  | ENUMERATED(pre-change-notification, ...) | Indicates the Cell Coverage State is planned to be used at the next reconfiguration. | – |  |
| **>>Cell Replacing Info** | C-ifCellDeploymentStatusIndicatorPresent |  |  |  | – |  |
| **>>>Replacing Cells** |  | *0 .. <maxnoofCellsinNG-RAN node>* |  |  | – |  |
| >>>>Global NG-RAN Cell Identity |  |  | Global Cell Identity9.2.2.73 | Global Cell Identity of a cell that may replace all or part of the coverage of the cell to be modified. In this version of the specification, only a NG-RAN cell identifier can be included. | – |  |
| **>>SSB Coverage Modification List** |  | *0..1* |  | List of SSB beams with modified coverage. | – |  |
| **>>>SSB Coverage Modification Item** |  | *0..<maxnoofSSBAreas>* |  |  | – |  |
| >>>>SSB Index | M |  | INTEGER (0..63) | Identifier of the SSB beam to be modified. | – |  |
| >>>>SSB Coverage State | M |  | INTEGER (0..15, …) | Value ‘0’ indicates that the SSB beam is inactive. Other values Indicates that the SSB beam is active and also indicates the coverage configuration of the concerned SSB beam. | – |  |
| >>Coverage Modification Cause | O |  | ENUMERATED (coverage, cell edge capacity, ..., network energy saving) | Indicates the reason for the coverage modification in NG-RAN node1. | YES | ignore |
| Local NG-RAN Node Identifier | O |  | 9.2.2.101 |  | YES | ignore |
| **Neighbour NG-RAN Node List** |  | *0..<maxnoofNeighbourNG-RAN nodes>* |  |  | YES | ignore |
| *>*Global NG-RAN Node ID | M |  | 9.2.2.3 |  | – |  |
| >Local NG-RAN Node Identifier | M |  | 9.2.2.101 |  | – |  |
| Local NG-RAN Node Identifier Removal | O |  | Local NG-RAN Node Identifier9.2.2.101 |  | YES | ignore |
| WAB-MT Identifier | O |  | 9.2.2.109 | Contains the identifier of the WAB-MT co-located with the WAB-gNB that sends this message, assigned by the WAB-MT’s BH-gNB. | YES | ignore |
| **Future Coverage Modification List** |  | *0..1* |  | List of cells whose coverage will be modified. | YES | ignore |
| **>Future Coverage Modification Item** |  | *1..<maxnoofCellsinNG-RAN node>* |  |  | – |  |
| >>NR CGI | M |  | 9.2.2.7 | Identifier of the NR cell whose coverage will be modified. | – |  |
| >>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 indicates the future coverage configuration of the concerned cell. | – |  |
| **>>Future SSB Coverage Modification List** |  | *0..1* |  | List of SSB beams whose coverage will be modified. | – |  |
| **>>>Future SSB Coverage Modification Item** |  | *1..<maxnoofSSBAreas>* |  |  | – |  |
| >>>>SSB index | M |  | INTEGER (0..63) | Identifier of the SSB beam whose coverage will be modified. | – |  |
| >>>>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 Indicates the future coverage configuration of the concerned SSB beams. | – |  |
| >>Predicted Coverage Modification Cause | O |  | ENUMERATED (coverage, cell edge capacity, cancel, ...) | Indicates the reason for the predicted coverage modification in NG-RAN node1, or that a previously sent Future Coverage Modification List is cancelled. | – |  |
| >>Time for Future Coverage State | 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 NG-RAN node1 relative to the time of receiving this information, in seconds. This IE is ignored if the Predicted Coverage Modification Cause is set to “cancel”. | – |  |

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| Range bound | Explanation |
| maxnoofTNLAssociations | Maximum numbers of TNL Associations between the NG RAN nodes. Value is 32. |
| maxnoofCellsinNG-RAN node | Maximum no. cells that can be served by a NG-RAN node. Value is 16384. |
| maxnoofSSBAreas | Maximum no. SSB Areas that can be served by a cell. Value is 64. |
| maxnoofNeighbourNG-RAN nodes | Maximum no. of neighbour NG-RAN nodes. Value is 256. |

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| Condition | Explanation |
| ifCellDeploymentStatusIndicatorPresent | This IE shall be present if the *Cell Deployment Status Indicator* IE is present. |

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#### 9.2.3.186 UE Performance Collection Configuration

This IE indicates the configuration for UE performance measurement collection.

| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| --- | --- | --- | --- | --- |
| Collection Time Duration for UE Performance | M |  | INTEGER(1..5000, ...) | Time duration starting at successful handover or at successful SN addition within which the UE performance measurements are collected.Unit: millisecond |

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### 9.3.5 Information Element definitions

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

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

 nR-CGI NR-CGI,

 future-cellCoverageState INTEGER (0..63, ...),

 future-SSB-Coverage-Modification-List Future-SSB-Coverage-Modification-List OPTIONAL,

 predicted-Coverage-Modification-Cause Predicted-CoverageModificationCause OPTIONAL,

 timeForFutureCoverageState INTEGER (1..60, ...) OPTIONAL,

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

 ...

}

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

 ...

}

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