**3GPP RAN WG3 Meeting #120 R3-233434**

**Incheon, KR, 22nd – 26th May, 2023**

Agenda Item: 12.2.2.1

Source: ZTE,?

Title: (TP to 38.423) AIRAN impact on Xn Interface

Document for: Other

# TP to 38.423 BLCR

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**<Unchanged Text Omitted>**

#### 9.1.1.1 HANDOVER REQUEST

This message is sent by the source NG-RAN node to the target NG-RAN node to request the preparation of resources for a handover.

Direction: source NG-RAN node  target NG-RAN node.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.2.3.1 |  | YES | reject |
| Source NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the source NG-RAN node | YES | reject |
| Cause | M |  | 9.2.3.2 |  | YES | reject |
| Target Cell Global ID | M |  | 9.2.3.25 | Includes either an E-UTRA CGI or an NR CGI | YES | reject |
| GUAMI | M |  | 9.2.3.24 |  | YES | reject |
| **UE Context Information** |  | *1* |  |  | YES | reject |
| >NG-C UE associated Signalling reference | M |  | AMF UE NGAP ID  9.2.3.26 | Allocated at the AMF on the source NG-C connection. | – |  |
| >Signalling TNL association address at source NG-C side | M |  | CP Transport Layer Information  9.2.3.31 | This IE indicates the AMF’s IP address of the SCTP association used at the source NG-C interface instance.  Note: If no UE TNLA binding exists at the source NG-RAN node, the source NG-RAN node indicates the TNL association address it would have selected if it would have had to create a UE TNLA binding. | – |  |
| >UE Security Capabilities | M |  | 9.2.3.49 |  | – |  |
| >AS Security Information | M |  | 9.2.3.50 |  | – |  |
| >Index to RAT/Frequency Selection Priority | O |  | 9.2.3.23 |  | – |  |
| >UE Aggregate Maximum Bit Rate | M |  | 9.2.3.17 |  | – |  |
| >PDU Session Resources To Be Setup List |  | *1* | 9.2.1.1 | Similar to NG-C signalling, containing UL tunnel information per PDU Session Resource;  and in addition, the source side QoS flow ⇔ DRB mapping | – |  |
| >RRC Context | M |  | OCTET STRING | Either includes the *HandoverPreparationInformation* message as defined in subclause 10.2.2. of TS 36.331 [14], or the *HandoverPreparationInformation-NB* message as defined in subclause 10.6.2 of TS 36.331 [14], if the target NG-RAN node is an ng-eNB,  or the *HandoverPreparationInformation* message as defined in subclause 11.2.2 of TS 38.331 [10], if the target NG-RAN node is a gNB. | – |  |
| >Location Reporting Information | O |  | 9.2.3.47 | Includes the necessary parameters for location reporting. | – |  |
| >Mobility Restriction List | O |  | 9.2.3.53 |  | – |  |
| >5GC Mobility Restriction List Container | O |  | 9.2.3.100 |  | YES | ignore |
| >NR UE Sidelink Aggregate Maximum Bit Rate | O |  | 9.2.3.107 | This IE applies only if the UE is authorized for NR V2X services. | YES | ignore |
| >LTE UE Sidelink Aggregate Maximum Bit Rate | O |  | 9.2.3.108 | This IE applies only if the UE is authorized for LTE V2X services. | YES | ignore |
| >ManagementBasedMDT PLMN List | O |  | MDT PLMN List  9.2.3.133 |  | YES | ignore |
| >UE Radio Capability ID | O |  | 9.2.3.138 |  | YES | reject |
| >MBS Session Information List | O |  | 9.2.1.36 |  | YES | ignore |
| >5G ProSe UE PC5 Aggregate Maximum Bit Rate | O |  | NR UE Sidelink Aggregate Maximum Bit Rate  9.2.3.107 | This IE applies only if the UE is authorized for 5G ProSe services. | YES | ignore |
| >UE Slice Maximum Bit Rate List | O |  | 9.2.3.167 |  | YES | ignore |
| Trace Activation | O |  | 9.2.3.55 |  | YES | ignore |
| Masked IMEISV | O |  | 9.2.3.32 |  | YES | ignore |
| UE History Information | M |  | 9.2.3.64 |  | YES | ignore |
| **UE Context Reference at the S-NG-RAN node** | O |  |  |  | YES | ignore |
| >Global NG-RAN Node ID | M |  | 9.2.2.3 |  | – |  |
| >S-NG-RAN node UE XnAP ID | M |  | NG-RAN node UE XnAP ID  9.2.3.16 |  | – |  |
| **Conditional Handover Information Request** | O |  |  |  | YES | reject |
| >CHO Trigger | M |  | ENUMERATED (CHO-initiation, CHO-replace, …) |  | – |  |
| >Target NG-RAN node UE XnAP ID | C-ifCHOmod |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the target NG-RAN node | – |  |
| >Estimated Arrival Probability | O |  | INTEGER (1..100) |  | – |  |
| NR V2X Services Authorized | O |  | 9.2.3.105 |  | YES | ignore |
| LTE V2X Services Authorized | O |  | 9.2.3.106 |  | YES | ignore |
| PC5 QoS Parameters | O |  | 9.2.3.109 | This IE applies only if the UE is authorized for NR V2X services. | YES | ignore |
| Mobility Information | O |  | BIT STRING (SIZE (32)) | Information related to the handover; the source NG-RAN node provides it in order to enable later analysis of the conditions that led to a wrong HO. | YES | ignore |
| UE History Information from the UE | O |  | 9.2.3.110 |  | YES | ignore |
| IAB Node Indication | O |  | ENUMERATED (true, ...) |  | YES | reject |
| No PDU Session Indication | O |  | ENUMERATED (true, ...) | This IE applies only if the UE is an IAB-MT. | YES | ignore |
| Time Synchronisation Assistance Information | O |  | 9.2.3.153 |  | YES | ignore |
| QMC Configuration Information | O |  | 9.2.3.156 |  | YES | ignore |
| 5G ProSe Authorized | O |  | 9.2.3.159 |  | YES | ignore |
| 5G ProSe PC5 QoS Parameters | O |  | 9.2.3.160 | This IE applies only if the UE is authorized for 5G ProSe services. | YES | ignore |
| Cell Based UE Trajectory Prediction | O |  | 9.2.3.x | The Cell Based UE trajectory prediction is only limited to the next one hop target NG-RAN node. | YES | ignore |
| AI/ML Measurement ID (FFS on the name) | O |  | 9.2.3.M |  | YES | ignore |

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| Condition | Explanation |
| ifCHOmod | This IE shall be present if the *CHO Trigger* IE is present and set to "CHO-replace". |

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| Range bound | Explanation |
| maxnoofMDTPLMNs | PLMNs in the Management Based MDT PLMN list. Value is 16. |

**<Unchanged Text Omitted>**

### .4.AA AI/ML Information Reporting Initiation (FFS on the name)

#### 8.4.AA.1 General

This procedure is used by an NG-RAN node to request the reporting of AI/ML related information to another NG-RAN node.

The procedure uses non UE-associated signalling.

*Editor’s Note: FFS other information that can be requested using this procedure.*

*Editor’s Note: FFS content of AL/ML related information.*

#### 8.4.AA.2 Successful Operation



Figure 8.4.AA.2-1: AI/ML Information Reporting Initiation, successful operation

NG-RAN node1 initiates the procedure by sending the AI/ML INFORMATION REQUEST message to NG-RAN node2 to start AI/ML related information reporting and stop AI/ML related information reporting. Upon receipt, NG-RAN node2:

- shall initiate the requested AI/ML related information reporting according to the parameters given in the request in case the *Registration Request* IE is set to "start"; or

- shall stop all cells AI/ML related information reporting and terminate the reporting in case the *Registration Request* IE is set to "stop"; or

- FFS

If the *Registration Request* IE is set to "start" in the AI/ML INFORMATION REQUEST message and the *Report Characteristics* IE indicates cell specific AI/ML related information reporting, the *Cell To Report List* IE shall be included.

If NG-RAN node2 is capable to provide all or part of (exact details of if and how to support partial reporting are FFS) requested information, it shall initiate the AI/ML related information reporting as requested by NG-RAN node1 and respond with the AI/ML INFORMATION RESPONSE message.

If the *Reporting Periodicity* IE in the AI/ML INFORMATION REQUEST is present, this indicates the periodicity for the reporting of periodic AI/ML related information. The NG-RAN node2 shall report only once, unless otherwise requested within the *Reporting Periodicity* IE.

**Interaction with other procedures**

When starting a measurement, the *Report Characteristics* IE in the AI/ML INFORMATION REQUEST indicates the type of objects NG-RAN node2 shall perform measurements or prediction on. NG-RAN node2 shall include in the AI/ML INFORMATION UPDATE message:

- the *Predicted Radio* *Resource Status* IE, if the first bit, "Predicted Radio Resource Status" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1". FFS on the details of *Predicted Radio* *Resource Status* IE.

- the *Predicted* *Number of Active UEs* IE, if the second bit, "Predicted Number of Active UEs" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1";

- the *Predicted* *RRC Connections* IE, if the third bit, "Predicted RRC Connections" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *Average UE Throughput DL* IE, if the fourth bit, "Average UE Throughput DL" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *Average UE Throughput UL* IE, if the fifth bit, "Average UE Throughput UL" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *Average Packet Delay* IE, if the sixth bit, "Average Packet Delay" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *Average Packet Loss* IE, if the seventh bit, "Average Packet Loss" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *Energy Cost* IE, if the eighth bit, "Energy Cost" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

- the *UE Trajectory* IE, if the ninth bit, " UE Trajectory" of the *Report Characteristics* IE included in the AI/ML INFORMATION REQUEST message is set to "1".

**<Unchanged Text Omitted>**

#### 9.1.3.CC AI/ML INFORMATION REQUEST (FFS on the name)

This message is sent by NG-RAN node1 to NG-RAN node2 to initiate the requested AI/ML related information reporting according to the parameters given in the message.

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 |
| NG-RAN node1 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node1 | YES | reject |
| NG-RAN node2 Measurement ID (FFS on the name) | C-ifRegistrationRequestStop |  | INTEGER (1..4095,...) | Allocated by NG-RAN node2 | YES | ignore |
| Registration Request | M |  | ENUMERATED(start, stop, …) (FFS on others) | Type of request for which the AI/ML related information is required. | YES | reject |
| Report Characteristics | C-ifRegistrationRequestStart |  | BITSTRING  (SIZE(32)) | Each position in the bitmap indicates the object the NG-RAN node2 is requested to report.  First Bit = Predicted Radio Resource Status,  Second Bit = Predicted Number of Active UEs,  Third Bit = Predicted RRC connections  Fourth Bit = Average UE Throughput DL,  Fifth Bit = Average UE Throughput UL,  Sixth Bit = Average Packet Delay,  Seventh Bit = Average Packet Loss  Eight Bit = Energy Cost  Ninth Bit = UE trajectory  FFS on the coding | YES | reject |
| **Cell To Report List** |  | *0..1* |  | Cell ID list to which the request applies. | YES | ignore |
| >**Cell To Report Item** |  | *1 .. <maxnoofCellsinNG-RANnode>* |  |  | – |  |
| >>Cell ID | M |  | Global NG-RAN Cell Identity  9.2.2.27 |  | – |  |
| Reporting Periodicity | O |  | ENUMERATED(500ms, 1000ms, 2000ms, 5000ms, 10000ms, …) | Periodicity that can be used for reporting of requested objects. Also used as the averaging window length for all objects if supported. | YES | ignore |

|  |  |
| --- | --- |
| Condition | Explanation |
| ifRegistrationRequestStop | This IE shall be present if the *Registration Request* IE is set to the value "stop". |
| ifRegistrationRequestStart | This IE shall be present if the Registration Request IE is set to the value "start". |

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

#### 9.1.3.DD AI/ML INFORMATION RESPONSE (FFS on the name)

This message is sent by NG-RAN node2 to NG-RAN node1 to indicate that the requested AI/ML related information, for all or part of (exact details of if and how to support partial reporting are FFS) the objects included in the reporting is successfully initiated.

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 | reject |
| NG-RAN node1 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node1 | YES | reject |
| NG-RAN node2 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node2 | YES | reject |
| Failed Reporting Characteristics (FFS) | O |  | BITSTRING  (SIZE(32)) | Each position in the bitmap indicates the object the NG-RAN node2 is able to report.  First Bit = Predicted Radio Resource Status,  Second Bit = Predicted Number of Active UEs,  Third Bit = Predicted RRC connections,  Fourth Bit = Average UE Throughput DL,  Fifth Bit = Average UE Throughput UL,  Sixth Bit = Average Packet Delay,  Seventh Bit = Average Packet Loss  FFS on the coding | YES | reject |
| Criticality Diagnostics | O |  | 9.2.3.3 |  | YES | ignore |

#### 9.1.3.EE AI/ML INFORMATION FAILURE (FFS on the name)

This message is sent by the NG-RAN node2 to NG-RAN node1 to indicate that for all of (exact details of if and how to support partial reporting are FFS) the requested objects the reporting cannot be initiated.

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 | reject |
| NG-RAN node1 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node1 | YES | reject |
| NG-RAN node2 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node2 | YES | reject |
| Cause | M |  | 9.2.3.2 |  | YES | ignore |
| Criticality Diagnostics | O |  | 9.2.3.3 |  | YES | ignore |

#### 9.1.3.FF AI/ML INFORMATION UPDATE (FFS on the name)

This message is sent by NG-RAN node2 to NG-RAN node1 to report the requested AI/ML related information.

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 |
| NG-RAN node1 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node1 | YES | reject |
| NG-RAN node2 Measurement ID (FFS on the name) | M |  | INTEGER (1..4095,...) | Allocated by NG-RAN node2 | YES | reject |
| **Cell AI/ML Info Result** (FFS on the name) |  | *0..1* |  |  | YES | ignore |
| **>Cell AI/ML Info Result Item** (FFS on the name) |  | *1 .. < maxnoofCellsinNG-RANnode >* |  |  |  |  |
| >>Cell ID | M |  | Global NG-RAN Cell Identity  9.2.2.27 |  | – |  |
| >>Predicted Radio Resource Status | O |  | 9.2.2.50 |  | – |  |
| >>Predicted Number of Active UEs | O |  | 9.2.2.62 |  | –- |  |
| >>Predicted RRC Connections | O |  | 9.2.2.56 |  | – |  |
| **UE Associated Info Result** |  | *0..1* |  |  |  |  |
| **> UE Associated Info Result Item** |  | *1 .. < maxnoofUEReports >* |  |  |  |  |
| >> UE Assistant Identifier (FFS) | M |  | FFS |  |  |  |
| >> UE Performance | O |  | 9.2.3.Y |  |  |  |
| >> UE trajectory | O |  | FFS |  |  |  |
| Energy Cost | O |  | FFS | It represents the actual measurement of the Energy Cost (FFS) |  |  |

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

<<<<<<<<<<<<<<<<<<<< Changes End >>>>>>>>>>>>>>>>>>>>