**3GPP TSG-RAN WG3 Meeting #122 R3-237803**

**Chicago, USA, November 13th – November 17th, 2023**

Agenda Item: 10.2.5

Source: Ericsson, Samsung, Nokia, Nokia Shanghai Bell, Lenovo

Title: (TP for SON to BLCR for TS 38.423) LBT failures in MRO

Document for: Approval

# 1 Introduction

This document contains a TP for TS 38.423 to capture the RAN3 agreements related to reporting of DL LBT failures occurred at the target NG-RAN node during handover execution.

# TP for TS 38.423

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

### 9.1.1 Messages for Basic Mobility Procedures

#### 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 |
| LBT Failure Information Request | O |  | ENUMERATED (inquiry, …) | This IE indicates that information on DL LBT Failures occurring at the target NG-RAN node during handover execution is requested. | 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". |

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

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

#### 9.1.3.25 ACCESS AND MOBILITY INDICATION

This message is sent by NG-RAN node1 to transfer access and mobility related information to NG-RAN node2.

Direction: NG-RAN node 1 → NG-RAN node 2.

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| Message Type | M |  | 9.2.3.1 |  | YES | ignore |
| **RACH Report List** |  | *0..1* |  |  | YES | ignore |
| **>RACH Report List Item** |  | *1 .. <maxnoofRACHReports>* |  |  | EACH | ignore |
| >>RACH Report Container | M |  | OCTET STRING | Includes the *RA-ReportList* IE as defined in subclause 6.2.2 in TS 38.331 [10]. | YES | ignore |
| >>UE Assistant Identifier | O |  | NG-RAN node UE XnAP ID  9.2.3.16 |  | YES | ignore |
| **Successful HO Report List** |  | *0..1* |  |  | YES | ignore |
| **>Successful HO Report List Item** |  | *1 .. <maxnoofSuccessfulHOReports>* |  |  | – |  |
| >>Successful HO Report Container | M |  | OCTET STRING | Includes the *SuccessHO-Report* IE as defined in subclause 6.2.2 in TS 38.331 [10]. | – |  |
| **LBT Failure Information List** |  | *0..1* |  |  | YES | ignore |
| **> LBT Failure Information Item** |  | *1 .. <maxnoofLBTFailureInformation>* |  |  |  |  |
| >>LBT Failure Information | M |  | 9.2.3.x |  | – |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofRACHReports | Maximum no. of RACH Reports, the maximum value is 64. |
| maxnoofSuccessfulHOReports | Maximum no. of Successful HO Reports, the maximum value is 64. |
| maxnoofLBTFailureInformation | Maximum no. of UEs for which LBT Failure Information is provided, the maximum value is 64. |

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

#### 9.2.3.x LBT Failure Information

This IE contains information on DL LBT Failures at the target NG-RAN node during handover execution.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| UE Assistant Identifier | M |  | Source NG-RAN node UE XnAP ID  9.2.3.16 |  |
| Number of DL LBT Failures | O |  | INTEGER (1..1000,…) | This IE indicates the number of DL LBT Failures, if available, occurring at the target gNB node during handover execution |

<<<<<<<<<<<<<<<<<<<< Next Change (ASN.1) >>>>>>>>>>>>>>>>>>>>

### 9.3.4 PDU Definitions

(skip unchanged)

QMCConfigInfo,

FiveGProSeAuthorized,

FiveGProSePC5QoSParameters,

ServedCellSpecificInfoReq-NR,

NRPagingeDRXInformation,

NRPagingeDRXInformationforRRCINACTIVE,

SDTSupportRequest,

SDT-Termination-Request,

SDTPartialUEContextInfo,

SDTDataForwardingDRBList,

PEIPSassistanceInformation,

UESliceMaximumBitRateList,

PagingCause,

MDTPLMNModificationList,

F1-terminatingIAB-donorIndicator,

SRB-ID,

AdditionalListofPDUSessionResourceChangeConfirmInfo-SNterminated,

HashedUEIdentityIndexValue,

DLLBTFailureInformationRequest,

DLLBTFailureInformationList

FROM XnAP-IEs

(skip unchanged)

id-ManagementBasedMDTPLMNModificationList,

id-F1-terminatingIAB-donorIndicator,

id-AdditionalListofPDUSessionResourceChangeConfirmInfo-SNterminated,

id-HashedUEIdentityIndexValue,

id-DLLBTFailureInformationRequest,

id-DLLBTFailureInformationList,

maxnoofCellsinNG-RANnode,

maxnoofDRBs,

maxnoofPDUSessions,

maxnoofQoSFlows,

maxnoofServedCellsIAB,

maxnoofTrafficIndexEntries,

maxnoofTLAsIAB,

maxnoofBAPControlPDURLCCHs,

maxnoofServingCells

FROM XnAP-Constants;

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

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-- HANDOVER REQUEST

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

HandoverRequest ::= SEQUENCE {

protocolIEs ProtocolIE-Container {{HandoverRequest-IEs}},

...

}

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

{ ID id-sourceNG-RANnodeUEXnAPID CRITICALITY reject TYPE NG-RANnodeUEXnAPID PRESENCE mandatory}|

{ ID id-Cause CRITICALITY reject TYPE Cause PRESENCE mandatory}|

{ ID id-targetCellGlobalID CRITICALITY reject TYPE Target-CGI PRESENCE mandatory}|

{ ID id-GUAMI CRITICALITY reject TYPE GUAMI PRESENCE mandatory}|

{ ID id-UEContextInfoHORequest CRITICALITY reject TYPE UEContextInfoHORequest PRESENCE mandatory}|

{ ID id-TraceActivation CRITICALITY ignore TYPE TraceActivation PRESENCE optional }|

{ ID id-MaskedIMEISV CRITICALITY ignore TYPE MaskedIMEISV PRESENCE optional }|

{ ID id-UEHistoryInformation CRITICALITY ignore TYPE UEHistoryInformation PRESENCE mandatory}|

{ ID id-UEContextRefAtSN-HORequest CRITICALITY ignore TYPE UEContextRefAtSN-HORequest PRESENCE optional }|

{ ID id-CHOinformation-Req CRITICALITY reject TYPE CHOinformation-Req PRESENCE optional }|

{ ID id-NRV2XServicesAuthorized CRITICALITY ignore TYPE NRV2XServicesAuthorized PRESENCE optional }|

{ ID id-LTEV2XServicesAuthorized CRITICALITY ignore TYPE LTEV2XServicesAuthorized PRESENCE optional }|

{ ID id-PC5QoSParameters CRITICALITY ignore TYPE PC5QoSParameters PRESENCE optional }|

{ ID id-MobilityInformation CRITICALITY ignore TYPE MobilityInformation PRESENCE optional }|

{ ID id-UEHistoryInformationFromTheUE CRITICALITY ignore TYPE UEHistoryInformationFromTheUE PRESENCE optional }|

{ ID id-IABNodeIndication CRITICALITY reject TYPE IABNodeIndication PRESENCE optional }|

{ ID id-NoPDUSessionIndication CRITICALITY ignore TYPE NoPDUSessionIndication PRESENCE optional }|

{ ID id-TimeSynchronizationAssistanceInformation CRITICALITY ignore TYPE TimeSynchronizationAssistanceInformation PRESENCE optional }|

{ ID id-QMCConfigInfo CRITICALITY ignore TYPE QMCConfigInfo PRESENCE optional }|

{ ID id-FiveGProSeAuthorized CRITICALITY ignore TYPE FiveGProSeAuthorized PRESENCE optional }|

{ ID id-FiveGProSePC5QoSParameters CRITICALITY ignore TYPE FiveGProSePC5QoSParameters PRESENCE optional }|

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

...

}

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

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-- ACCESS AND MOBILITY INDICATION

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

AccessAndMobilityIndication ::= SEQUENCE {

protocolIEs ProtocolIE-Container {{ AccessAndMobilityIndication-IEs}},

...

}

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

{ ID id-RACHReportInformation CRITICALITY ignore TYPE RACHReportInformation PRESENCE optional}|

{ ID id-SuccessfulHOReportInformation CRITICALITY ignore TYPE SuccessfulHOReportInformation PRESENCE optional}|

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

...

}

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

### 9.3.5 Information Element definitions

(skip unchanged)

maxnoofNeighbour-NG-RAN-Nodes,

maxnoofSRBs,

maxnoofSMBR,

maxnoofNSAGs,

maxnoofRBsetsPerCell1,

maxnoofTargetSNsMinusOne,

maxnoofThresholdsForExcessPacketDelay,

maxnoofLBTFailureInformation

FROM XnAP-Constants

-- D

(skip unchanged)

DLLBTFailureInformationRequest ::= ENUMERATED {inquiry, ...}

DLLBTFailureInformationList ::= SEQUENCE (SIZE(1.. maxnoofLBTFailureInformation)) OF DLLBTFailureInformationList-Item

DLLBTFailureInformationList-Item::= SEQUENCE {

uEAssistantIdentifier NG-RANnodeUEXnAPID,

numberOfDLLBTFailures INTEGER (1..1000,...) OPTIONAL,

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

...

}

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

...

}

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

### 9.3.7 Constant definitions

(skip unchanged)

maxnoofCSIRSneighbourCells INTEGER ::= 16

maxnoofCSIRSneighbourCellsInMTC INTEGER ::= 16

maxnoofNeighbour-NG-RAN-Nodes INTEGER ::= 256

maxnoofSRBs INTEGER ::= 5

maxnoofSMBR INTEGER ::= 8

maxnoofNSAGs INTEGER ::= 256

maxnoofTargetSNsMinusOne INTEGER ::= 7

maxnoofThresholdsForExcessPacketDelay INTEGER ::= 255

maxnoofLBTFailureInformation INTEGER ::= 64

(skip unchanged)

id-BeamMeasurementsReportConfiguration ProtocolIE-ID ::= 367

id-CoverageModificationCause ProtocolIE-ID ::= 368

id-AdditionalListofPDUSessionResourceChangeConfirmInfo-SNterminated ProtocolIE-ID ::= 369

id-UERLFReportContainerLTEExtension ProtocolIE-ID ::= 370

id-ExcessPacketDelayThresholdConfiguration ProtocolIE-ID ::= 371

id-HashedUEIdentityIndexValue ProtocolIE-ID ::= 372

id-QosFlowMappingIndication ProtocolIE-ID ::= 373

id-Full-and-Short-I-RNTI-Profile-List ProtocolIE-ID ::= 374

id-DLLBTFailureInformationRequest ProtocolIE-ID ::= xx1

id-DLLBTFailureInformation ProtocolIE-ID ::= xx2

END

-- ASN1STOP

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