**3GPP T****SG-RAN WG3 Meeting #124** **R3-243790**

**Fukuoka, Japan, May 20th – 24th, 2024**

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| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** | **2** | **Current version:** |  |  |
|  |
| *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:***  | LTM correction for UE-based TA information from CU to DU |
|  |  |
| ***Source to WG:*** | LG Electronics Inc., Huawei, Ericsson, Lenovo, Samsung, ZTE, CATT, Google, Nokia, NEC |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_Mob\_enh2-Core |  | ***Date:*** | 2024-05-24 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | Rel-18 |
|  | *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:*** | Rel-18 Intra-CU LTM specified two mechanisms of pre-calculating UL TA values for faster RACH-less access to a candidate cell (called “early TA acquisition”): 1. NW obtains UL TA values of candidate cells before cell switch (by PDDCH-ordering the UE to initiate RACH) and configures the pre-acquired TA value to the UE in the LTM Cell Switch Command.
2. “UE-based TA measurements”, where CU configures the UE to derive UL TA on its own based on the Rx timing difference between the current serving cell and candidate cell, together with the current TA value.

The second mechanism has been designed in a way that it cannot be used unless the serving DU explicitly indicates so (set to “FFF”) via LTM Cell Switch Command (even though configured to the UE via RRC by CU). However, **DU is currently obvilous of whether CU configured the UE-based TA measurements to the UE and for which cells.** As a result, the serving DU (who is not aware) won’t be able to indicate the UE to use it at all. Instead, it will execute the first mechanism for a candidate cell (for which the UE-based TA measurement has already been configured) to provide the TA value in the LTM Cell Switch Command, where the UE has to unnecessarily follow the PDCCH order and initiate RACH to that candidate cell. Due to its cascaded design, the UE-based TA measurement feature may not work as intended, if such configuration from CU is not known to DU who controls early RACH and decides cell switch.  |
|  |  |
| ***Summary of change:*** | In the UE CONTEXT MODIFICATION REQUEST, 1. Reshape the *Early Sync Information List* IE into two separate IEs, one for candidate cell information (*Early Sync Candidate Cell Information List* IE) and the other for serving cell information (*Early Sync Serving Cell Information* IE),

(2) For each separated IE, added OCTET STRING of * *UE Based TA Measurement Configuration* IE, which refers to *ltm-UE-MeasuredTA-ID-r18* IE when in *Early Sync Candidate Cell Information List* IE and refers to *ltm-ServingCellUE-MeasuredTA-ID-r18* IE when in *Early Sync Serving Cell Information* IE

so that CU can provide the UE-based TA measurement configured to the UE for the candiate cells and serving cell toward a DU. The corresponding descriptions and semantics are added. **Impact assessment towards the previous version of the specification (same release):**This CR has an isolated impact towards the previous version of the specification (same release).This CR only has an impact on LTM early UL acquisition function between CU and DU. |
|  |  |
| ***Consequences if not approved:*** | The UE-based TA measurement feature in Rel-18 LTM may not work as intended. |
|  |  |
| ***Clauses affected:*** | 8.3.4.2, 9.2.2.7, 9.4.4, 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:*** | Rev1: re-purposed for RAN3-124 based on offline discussions with more co-source companies.Rev2: updated based on comments during RAN3-124 |

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

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

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#### 8.3.4.2 Successful Operation

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If the *Network Controlled Repeater Authorized* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, update its authorization information for the UE accordingly. If the *Network Controlled Repeater Authorized* IE is set to "not authorized", the gNB-DU shall, if supported, initiate actions to ensure that the UE is no longer accessing as a Network Controlled Repeater.

If the *LTM Indicator* IE set to "true" is contained in the *LTM Information Modify* IEincluded in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, consider that the request concerns LTM for the included *SpCell ID* IE and shall include it as the *Requested Target Cell ID* IE in the UE CONTEXT MODIFICATION RESPONSE message. If the gNB-DU accepts the request for LTM for that *SpCell*, the gNB-DU shall generate and include the *CellGroupConfig* IE for the accepted LTM candidate cell in the UE CONTEXT MODIFICATION RESPONSE message.

If the *Request for Lower Layer Configuration* IE set to "true" is contained within the *Reference Configuration* IE in the *LTM Information Modify* IEincluded in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, include the *Reference Configuration Information* IE in the *LTM Configuration* IE in the UE CONTEXT MODIFICATION RESPONSE message to provide lower layer configuration for the gNB-CU to generate the LTM reference configuration.

If the *Reference Configuration Information* IE is contained within the *Reference Configuration* IE in the *LTM Information Modify* IE included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account for generating the LTM lower layer configuration.

If the *CSI Resource Configuration* IEis contained in the *LTM Information Modify* IE included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, use it to generate the LTM CSI reporting configuration in the *CellGroupConfig* IE for the requested LTM candidate cell.

If the *LTM Configuration ID Mapping List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, consider this as the mapping information for the LTM candidate cell(s).

If the *Request for RACH Configuration* IE set to "true" is contained in the *Early Sync Information Request* IE included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account for early TA acquisition, and include the *Early UL Sync Configuration* and/or *Early UL Sync Configuration* *for SUL* IE in the UE CONTEXT MODIFICATION RESPONSE message.

If the *Early Sync Candidate Cell Information List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, use it as specified in TS 38.401 [4]. If the *UE Based TA Measurement Configuration* IE is contained in the *Early Sync Candidate Cell Information List* IE for some candidate cell, the gNB-DU shall, if supported, take them into account for UE based TA measurement during LTM cell switch as specified in TS 38.331 [8].

If the *Early Sync Serving Cell Information* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, use it as specified in TS 38.401 [4]. If the *UE Based TA Measurement Configuration* IE is contained in the *Early Sync Serving Cell Information* IE, the gNB-DU shall, if supported, take it into account for UE based TA measurement during LTM cell switch as specified in TS 38.331 [8].

If the *LTM Configuration* IE is included in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall, if supported, consider it as the generated configuration for LTM from the accepted candidate cell in the gNB-DU.

If the *LTM Cells to be Released List* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, release the configured candidate cells in the list.

If the *Complete Configuration Indicator* IE set to "complete" is contained in the *LTM Configuration* IE included in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall, if supported, consider that the LTM candidate configuration is a complete configuration.

If the *Direct Path Addition* IE is contained in the *Path Addition Information* IE which is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, consider that the request concerns the direct path addition for the included *SpCell ID* IE as specified in TS 38.401 [4] and regard it as a reconfiguration with sync as defined in TS 38.331 [8]. If the *Indirect Path Addition* IE is contained in the *Path Addition Information* IE, the gNB-DU shall, if supported, consider that the request concerns the indirect path addition for the MP Remote UE using PC5 link and use it as specified in TS 38.401 [4]. If the *N3C* *Indirect Path Addition* IE is contained in the *Path Addition Information* IE, the gNB-DU shall, if supported, consider that the request concerns the indirect path addition for the MP Remote UE using N3C and use it as specified in TS 38.401 [4].

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### 9.2.2 UE Context Management messages

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#### 9.2.2.7 UE CONTEXT MODIFICATION REQUEST

This message is sent by the gNB-CU to provide UE Context information changes to the gNB-DU.

Direction: gNB-CU → gNB-DU

| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  | YES | reject |
| gNB-DU UE F1AP ID | M |  | 9.3.1.5 |  | YES | reject |
| SpCell ID | O |  | NR CGI 9.3.1.12 | Special Cell as defined in TS 38.321 [16]. For handover case, this IE is considered as target cell. | YES | ignore |
| ServCellIndex | O |  | INTEGER (0..31, ...) |  | YES | reject |
| SpCell UL Configured | O |  | Cell UL Configured9.3.1.33 |  | YES | ignore |
| DRX Cycle  | O |  | 9.3.1.24 |  | YES | ignore |
| CU to DU RRC Information | O |  | 9.3.1.25 |  | YES | reject |
| ////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////// |
| **LTM Information Modify** |  | *0..1* |  |  | YES | reject |
| >LTM Indicator | M |  | ENUMERATED (true, …) |  | - |  |
| >LTM Configuration ID | M |  | INTEGER (1..8) | Corresponds to the *LTM-CandidateId* IE, as defined in TS 38.331 [8]. | - |  |
| >Reference Configuration | O |  | 9.3.1.292 |  | - |  |
| >CSI Resource Configuration | O |  | 9.3.1.330 |  | - |  |
| LTM Configuration ID Mapping List | O |  | 9.3.1.294 |  | YES | reject |
| **Early Sync Information Request** |  | *0..1* |  |  | YES | ignore |
| >Request for RACH Configuration | O |  | ENUMERATED (true, …) |  | - |  |
| **Early Sync Candidate Cell Information List** |  | *0..1* |  |  | YES | ignore |
| **>Early Sync Candidate Cell Information Item IEs** |  | *1 .. <maxnoofLTMCells>* |  |  | EACH | ignore |
| >>Cell ID | M |  | NR CGI9.3.1.12 |  | - |  |
| >>TCI States Configurations List | O |  | 9.3.1.293 |  | - |  |
| >>Early UL Sync Configuration | O |  | 9.3.1.328 |  | - |  |
| >>Early UL Sync Configuration for SUL | O |  | Early UL Sync Configuration9.3.1.328 | This IE applies for SUL carrier. | - |  |
| >>TA Assistance Information | O |  | ENUMERATED (zero, …) | The value "zero" corresponds to TA value of the cell being equal to zero. | - |  |
| >>UE Based TA Measurement Configuration | O |  | OCTET STRING | Includes the *ltm-UE-MeasuredTA-ID-r18* IE, as defined in TS 38.331 [8], for the LTM candidate cell identified by the *Cell ID* IE.  | - |  |
| **Early Sync Serving Cell Information** |  | *0..1* |  |  | YES | ignore |
| >UE Based TA Measurement Configuration | O |  | OCTET STRING | Includes the *ltm-ServingCellUE-MeasuredTA-ID-r18* IE, as defined in TS 38.331 [8], for the current serving cell.  | - |  |
| **LTM Cells To Be Released List** | O |  | 9.3.1.291 |  | YES | ignore |
| Path Addition Information | O |  | 9.3.1.296 |  | YES | reject |
| NR A2X Services Authorized | O |  | 9.3.1.323 |  | YES | ignore |
| LTE A2X Services Authorized | O |  | 9.3.1.324 |  | YES | ignore |
| NR UE Sidelink Aggregate Maximum Bit Rate for A2X | O |  | NR UE Sidelink Aggregate Maximum Bit Rate9.3.1.119 | This IE applies only if the UE is authorized for NR A2X services. | YES | ignore |
| LTE UE Sidelink Aggregate Maximum Bit Rate for A2X | O |  | LTE UE Sidelink Aggregate Maximum Bit Rate9.3.1.118 | This IE applies only if the UE is authorized for LTE A2X services. | YES | ignore |
| DL LBT Failure Information Request | O |  | ENUMERATED (inquiry, …) |  | YES | ignore |
| Ranging and Sidelink Positioning Service Information | O |  | 9.3.1.331 | This IE applies only if the UE is authorized for NR V2X services and/or 5G ProSe services. | YES | ignore |

| **Range bound** | **Explanation** |
| --- | --- |
| maxnoofSCells | Maximum no. of SCells allowed towards one UE, the maximum value is 32. |
| maxnoofServingCellMOs | Maximum number of ServingCellMOs for NCD-SSB per cell. Maximum value is 16 |
| maxnoofSRBs | Maximum no. of SRB allowed towards one UE, the maximum value is 8.  |
| maxnoofDRBs | Maximum no. of DRB allowed towards one UE, the maximum value is 64.  |
| maxnoofULUPTNLInformation | Maximum no. of UL UP TNL Information allowed towards one DRB, the maximum value is 2. |
| maxnoofQoSFlows | Maximum no. of flows allowed to be mapped to one DRB, the maximum value is 64. |
| maxnoofBHRLCChannels | Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536. |
| maxnoofSLDRBs | Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512. |
| maxnoofPC5QoSFlows | Maximum no. of PC5 QoS flow allowed towards one UE for NR sidelink communication, the maximum value is 2048. |
| maxnoofAdditionalPDCPDuplicationTNL | Maximum no. of additional UP TNL Information allowed towards one DRB, the maximum value is 2.  |
| maxnoofCellsinCHO | Maximum no. cells that can be prepared for a conditional mobility. Value is 8. |
| maxnoofUuRLCChannels | Maximum no. of Uu Relay RLC channels for L2 U2N relaying or L2 N3C relaying per Relay UE, the maximum value is 32. |
| maxnoofPC5RLCChannels | Maximum no. of PC5 Relay RLC channel allowed for L2 U2N or U2U relaying per Remote UE or Relay UE, the maximum value is 512. |
| maxnoofMRBsforUE | Maximum no. of multicast MRB allowed towards one UE, the maximum value is 64. |
| maxnoofSLdestinations | Maximum number of destination for NR sidelink communication, the maximum value is 32 |
| maxnoofLTMCells | Maximum no. of Cells configured for LTM allowed towards one UE, the maximum value is 8. |

|  |  |
| --- | --- |
| **Condition** | **Explanation** |
| ifCHOcancel | This IE may be present if the *CHO Trigger* IE is present and set to "CHO-cancel". |

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

### 9.4.4 PDU Definitions

-- ASN1START

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

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-- PDU definitions for F1AP.

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

F1AP-PDU-Contents {

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

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

 LTMInformation-Setup,

 LTMConfigurationIDMappingList,

 LTMInformation-Modify,

 LTMCells-ToBeReleased-List,

 LTMConfiguration,

 EarlySyncInformation-Request,

 EarlySyncInformation,

 EarlySyncCandidateCellInformation-List,

 EarlySyncServingCellInformation,

 LTMCellSwitchInformation,

 DUtoCUTAInformation-List,

 CUtoDUTAInformation-List,

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

 id-LTMInformation-Setup,

 id-LTMConfigurationIDMappingList,

 id-LTMInformation-Modify,

 id-LTMCells-ToBeReleased-List,

 id-LTMConfiguration,

 id-EarlySyncInformation-Request,

 id-EarlySyncInformation,

 id-EarlySyncCandidateCellInformation-List,

 id-EarlySyncServingCellInformation,

 id-LTMCellSwitchInformation,

 id-DUtoCUTAInformation-List,

 id-CUtoDUTAInformation-List,

 id-Source-gNB-DU-ID,

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

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

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-- UE CONTEXT MODIFICATION REQUEST

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

UEContextModificationRequest ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { { UEContextModificationRequestIEs} },

 ...

}

UEContextModificationRequestIEs F1AP-PROTOCOL-IES ::= {

 { ID id-gNB-CU-UE-F1AP-ID CRITICALITY reject TYPE GNB-CU-UE-F1AP-ID PRESENCE mandatory }|

 { ID id-gNB-DU-UE-F1AP-ID CRITICALITY reject TYPE GNB-DU-UE-F1AP-ID PRESENCE mandatory }|

 { ID id-SpCell-ID CRITICALITY ignore TYPE NRCGI PRESENCE optional }|

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

 { ID id-SpCellULConfigured CRITICALITY ignore TYPE CellULConfigured PRESENCE optional }|

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

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

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

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

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

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

 { ID id-SCell-ToBeSetupMod-List CRITICALITY ignore TYPE SCell-ToBeSetupMod-List PRESENCE optional }|

 { ID id-SCell-ToBeRemoved-List CRITICALITY ignore TYPE SCell-ToBeRemoved-List PRESENCE optional }|

 { ID id-SRBs-ToBeSetupMod-List CRITICALITY reject TYPE SRBs-ToBeSetupMod-List PRESENCE optional }|

 { ID id-DRBs-ToBeSetupMod-List CRITICALITY reject TYPE DRBs-ToBeSetupMod-List PRESENCE optional }|

 { ID id-DRBs-ToBeModified-List CRITICALITY reject TYPE DRBs-ToBeModified-List PRESENCE optional }|

 { ID id-SRBs-ToBeReleased-List CRITICALITY reject TYPE SRBs-ToBeReleased-List PRESENCE optional }|

 { ID id-DRBs-ToBeReleased-List CRITICALITY reject TYPE DRBs-ToBeReleased-List PRESENCE optional }|

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

 { ID id-RAT-FrequencyPriorityInformation CRITICALITY reject TYPE RAT-FrequencyPriorityInformation PRESENCE optional }|

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

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

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

 { ID id-GNB-DUConfigurationQuery CRITICALITY reject TYPE GNB-DUConfigurationQuery PRESENCE optional }|

 { ID id-GNB-DU-UE-AMBR-UL CRITICALITY ignore TYPE BitRate PRESENCE optional }|

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

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

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

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

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

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

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

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

 { ID id-BHChannels-ToBeSetupMod-List CRITICALITY reject TYPE BHChannels-ToBeSetupMod-List PRESENCE optional }|

 { ID id-BHChannels-ToBeModified-List CRITICALITY reject TYPE BHChannels-ToBeModified-List PRESENCE optional }|

 { ID id-BHChannels-ToBeReleased-List CRITICALITY reject TYPE BHChannels-ToBeReleased-List PRESENCE optional }|

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

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

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

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

 { ID id-PC5LinkAMBR CRITICALITY ignore TYPE BitRate PRESENCE optional}|

 { ID id-SLDRBs-ToBeSetupMod-List CRITICALITY reject TYPE SLDRBs-ToBeSetupMod-List PRESENCE optional }|

 { ID id-SLDRBs-ToBeModified-List CRITICALITY reject TYPE SLDRBs-ToBeModified-List PRESENCE optional }|

 { ID id-SLDRBs-ToBeReleased-List CRITICALITY reject TYPE SLDRBs-ToBeReleased-List PRESENCE optional }|

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

 { ID id-F1CTransferPath CRITICALITY reject TYPE F1CTransferPath PRESENCE optional }|

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

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

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

 { ID id-F1CTransferPathNRDC CRITICALITY reject TYPE F1CTransferPathNRDC PRESENCE optional }|

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

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

 { ID id-CG-SDTQueryIndication CRITICALITY ignore TYPE CG-SDTQueryIndication PRESENCE optional }|

 { ID id-FiveG-ProSeAuthorized CRITICALITY ignore TYPE FiveG-ProSeAuthorized PRESENCE optional }|

 { ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }|

 { ID id-FiveG-ProSePC5LinkAMBR CRITICALITY ignore TYPE BitRate PRESENCE optional}|

 { ID id-UpdatedRemoteUELocalID CRITICALITY ignore TYPE RemoteUELocalID PRESENCE optional }|

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

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

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

 { ID id-PC5RLCChannelToBeSetupList CRITICALITY reject TYPE PC5RLCChannelToBeSetupList PRESENCE optional}|

 { ID id-PC5RLCChannelToBeModifiedList CRITICALITY reject TYPE PC5RLCChannelToBeModifiedList PRESENCE optional}|

 { ID id-PC5RLCChannelToBeReleasedList CRITICALITY reject TYPE PC5RLCChannelToBeReleasedList PRESENCE optional}|

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

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

 { ID id-MulticastMBSSessionSetupList CRITICALITY reject TYPE MulticastMBSSessionList PRESENCE optional }|

 { ID id-MulticastMBSSessionRemoveList CRITICALITY reject TYPE MulticastMBSSessionList PRESENCE optional }|

 { ID id-UE-MulticastMRBs-ToBeSetup-atModify-List CRITICALITY reject TYPE UE-MulticastMRBs-ToBeSetup-atModify-List PRESENCE optional }|

 { ID id-UE-MulticastMRBs-ToBeReleased-List CRITICALITY reject TYPE UE-MulticastMRBs-ToBeReleased-List PRESENCE optional }|

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

 { ID id-ManagementBasedMDTPLMNModificationList CRITICALITY ignore TYPE MDTPLMNModificationList PRESENCE optional }|

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

 { ID id-DAPS-HO-Status CRITICALITY ignore TYPE DAPS-HO-Status PRESENCE optional }|

 { ID id-ServingCellMO-List CRITICALITY ignore TYPE ServingCellMO-List PRESENCE optional }|

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

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

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

 { ID id-SDT-Volume-Threshold CRITICALITY ignore TYPE SDT-Volume-Threshold PRESENCE optional }|

 { ID id-LTMInformation-Modify CRITICALITY reject TYPE LTMInformation-Modify PRESENCE optional }|

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

 { ID id-EarlySyncInformation-Request CRITICALITY ignore TYPE EarlySyncInformation-Request PRESENCE optional }|

 { ID id-EarlySyncCandidateCellInformation-List CRITICALITY ignore TYPE EarlySyncCandidateCellInformation-List PRESENCE optional }|

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

 { ID id-LTMCells-ToBeReleased-List CRITICALITY ignore TYPE LTMCells-ToBeReleased-List PRESENCE optional }|

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

 { ID id-NRA2XServicesAuthorized CRITICALITY ignore TYPE NRA2XServicesAuthorized PRESENCE optional }|

 { ID id-LTEA2XServicesAuthorized CRITICALITY ignore TYPE LTEA2XServicesAuthorized PRESENCE optional }|

 { ID id-NRUESidelinkAggregateMaximumBitrateForA2X CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }|

 { ID id-LTEUESidelinkAggregateMaximumBitrateForA2X CRITICALITY ignore TYPE LTEUESidelinkAggregateMaximumBitrate PRESENCE optional }|

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

 { ID id-SLPositioning-Ranging-Service-Info CRITICALITY ignore TYPE SLPositioning-Ranging-Service-Info PRESENCE optional },

 ...

}

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

### 9.4.5 Information Element Definitions

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

-- E

EarlyULSyncConfig ::= SEQUENCE {

 rACH RACHConfiguration,

 lTMgNB-DU-IDs-PreambleIndexList LTMgNB-DU-IDs-PreambleIndexList OPTIONAL,

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

 ...

}

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

 ...

}

EarlySyncInformation-Request ::= SEQUENCE {

 requestforRACHConfiguration RequestforRACHConfiguration OPTIONAL,

 lTMgNB-DU-IDsList LTMgNB-DU-IDsList OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { EarlySyncInformation-Request-ExtIEs} } OPTIONAL,

 ...

}

EarlySyncInformation-Request-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

EarlySyncInformation ::= SEQUENCE {

 tCIStatesConfigurationsList TCIStatesConfigurationsList,

 earlyULSyncConfig EarlyULSyncConfig OPTIONAL,

 earlyULSyncConfigSUL EarlyULSyncConfig OPTIONAL,

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

 ...

}

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

 ...

}

EarlySyncCandidateCellInformation-List ::= SEQUENCE (SIZE (1.. maxnoofLTMCells)) OF EarlySyncCandidateCellInformation-Item

EarlySyncCandidateCellInformation-Item ::= SEQUENCE {

 nRCGI NRCGI,

 tCIStatesConfigurationsList TCIStatesConfigurationsList OPTIONAL,

 earlyULSyncConfig EarlyULSyncConfig OPTIONAL,

 earlyULSyncConfigSUL EarlyULSyncConfig OPTIONAL,

 tAAssistanceInfo TAAssistanceInfo OPTIONAL,

 uEbasedTAmeasurementConfig OCTET STRING OPTIONAL,

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

 ...

}

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

 ...

}

EarlySyncServingCellInformation ::= SEQUENCE {

 uEbasedTAmeasurementConfig OCTET STRING OPTIONAL,

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

 ...

}

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

 ...

}

E-CID-MeasurementQuantities ::= SEQUENCE (SIZE (1.. maxnoofMeasE-CID)) OF ProtocolIE-SingleContainer { {E-CID-MeasurementQuantities-ItemIEs} }

E-CID-MeasurementQuantities-ItemIEs F1AP-PROTOCOL-IES ::= {

 { ID id-E-CID-MeasurementQuantities-Item CRITICALITY reject TYPE E-CID-MeasurementQuantities-Item PRESENCE mandatory}

}

E-CID-MeasurementQuantities-Item ::= SEQUENCE {

 e-CIDmeasurementQuantitiesValue E-CID-MeasurementQuantitiesValue,

 iE-Extensions ProtocolExtensionContainer { { E-CID-MeasurementQuantitiesValue-ExtIEs} } OPTIONAL

}

E-CID-MeasurementQuantitiesValue-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

### 9.4.7 Constant Definitions

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

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

--

-- IEs

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

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////

id-LTMCells-ToBeReleased-List ProtocolIE-ID ::= 723

id-LTMCells-ToBeReleased-Item ProtocolIE-ID ::= 724

id-LTMConfiguration ProtocolIE-ID ::= 725

id-EarlySyncInformation-Request ProtocolIE-ID ::= 726

id-EarlySyncInformation ProtocolIE-ID ::= 727

id-EarlySyncCandidateCellInformation-List ProtocolIE-ID ::= 728

id-LTMCellSwitchInformation ProtocolIE-ID ::= 729

id-DUtoCUTAInformation-List ProtocolIE-ID ::= 730

id-Source-gNB-DU-ID ProtocolIE-ID ::= 731

id-dRB-List ProtocolIE-ID ::= 732

id-DeactivationIndication ProtocolIE-ID ::= 733

id-RAReportIndicationList ProtocolIE-ID ::= 734

id-ChannelOccupancyTimePercentageUL ProtocolIE-ID ::= 735

id-SuccessfulPSCellChangeReportInformationList ProtocolIE-ID ::= 736

id-RadioResourceStatusNR-U ProtocolIE-ID ::= 737

id-FiveG-ProSeLayer2Multipath ProtocolIE-ID ::= 738

id-FiveG-ProSeLayer2UEtoUERelay ProtocolIE-ID ::= 739

id-FiveG-ProSeLayer2UEtoUERemote ProtocolIE-ID ::= 740

id-PathAdditionInformation ProtocolIE-ID ::= 741

id-Recommended-SSBs-List ProtocolIE-ID ::= 742

id-Recommended-SSBs-for-Paging-List ProtocolIE-ID ::= 743

id-SSBs-withinTheCell-tobe-Activated-List ProtocolIE-ID ::= 744

id-Cells-With-SSBs-Activated-List ProtocolIE-ID ::= 745

id-Cells-Allowed-to-be-Deactivated-List ProtocolIE-ID ::= 746

id-Cells-Allowed-to-be-Deactivated-List-Item ProtocolIE-ID ::= 747

id-Coverage-Modification-Cause ProtocolIE-ID ::= 748

id-RANTSSRequestType ProtocolIE-ID ::= 749

id-RANTimingSynchronisationStatusInfo ProtocolIE-ID ::= 750

id-TSCTrafficCharacteristicsFeedback ProtocolIE-ID ::= 751

id-RANfeedbacktype ProtocolIE-ID ::= 752

id-Mobile-TRP-LocationInformation ProtocolIE-ID ::= 753

id-Mobile-IAB-MT-UE-ID ProtocolIE-ID ::= 754

id-Target-gNB-ID ProtocolIE-ID ::= 755

id-Target-gNB-IP-address ProtocolIE-ID ::= 756

id-Target-SeGW-IP-address ProtocolIE-ID ::= 757

id-Activated-Cells-Mapping-List ProtocolIE-ID ::= 758

id-Activated-Cells-Mapping-List-Item ProtocolIE-ID ::= 759

id-F1SetupOutcome ProtocolIE-ID ::= 760

id-RRC-Terminating-IAB-Donor-Related-Info ProtocolIE-ID ::= 761

id-RRC-Terminating-IAB-Donor-gNB-ID ProtocolIE-ID ::= 762

id-NCGI-to-be-Updated-List ProtocolIE-ID ::= 763

id-NCGI-to-be-Updated-List-Item ProtocolIE-ID ::= 764

id-Mobile-IAB-MTUserLocationInformation ProtocolIE-ID ::= 765

id-MobileAccessPointLocation ProtocolIE-ID ::= 766

id-AssociatedSessionID ProtocolIE-ID ::= 767

id-IndicationMCInactiveReception ProtocolIE-ID ::= 768

id-MulticastCU2DURRCInfo ProtocolIE-ID ::= 769

id-MBSMulticastSessionReceptionState ProtocolIE-ID ::= 770

id-F1UTunnelNotEstablished ProtocolIE-ID ::= 771

id-MulticastDU2CURRCInfo ProtocolIE-ID ::= 772

id-SIB24-message ProtocolIE-ID ::= 773

id-MulticastCU2DUCommonRRCInfo ProtocolIE-ID ::= 774

id-PDUSetQoSParameters ProtocolIE-ID ::= 775

id-N6JitterInformation ProtocolIE-ID ::= 776

id-ECNMarkingorCongestionInformationReportingRequest ProtocolIE-ID ::= 777

id-ECNMarkingorCongestionInformationReportingStatus ProtocolIE-ID ::= 778

id-NRA2XServicesAuthorized ProtocolIE-ID ::= 779

id-LTEA2XServicesAuthorized ProtocolIE-ID ::= 780

id-NRUESidelinkAggregateMaximumBitrateForA2X ProtocolIE-ID ::= 781

id-LTEUESidelinkAggregateMaximumBitrateForA2X ProtocolIE-ID ::= 782

id-NReRedCapUEIndication ProtocolIE-ID ::= 783

id-ERedcap-Bcast-Information ProtocolIE-ID ::= 784

id-NRPaginglongeDRXInformationforRRCINACTIVE ProtocolIE-ID ::= 785

id-SCPAC-Request ProtocolIE-ID ::= 786

id-Target-F1-Terminating-Donor-gNB-ID ProtocolIE-ID ::= 787

id-MobileIAB-Barred ProtocolIE-ID ::= 788

id-Broadcast-MRBs-Transport-Request-List ProtocolIE-ID ::= 789

id-Broadcast-MRBs-Transport-Request-Item ProtocolIE-ID ::= 790

id-S-CPACLowerLayerReferenceConfigRequest ProtocolIE-ID ::= 791

id-S-CPAC-Configuration ProtocolIE-ID ::= 792

id-MusimCandidateBandList ProtocolIE-ID ::= 793

id-DLLBTFailureInformationRequest ProtocolIE-ID ::= 794

id-DLLBTFailureInformationList ProtocolIE-ID ::= 795

id-PSIbasedSDUdiscardUL ProtocolIE-ID ::= 796

id-SIB22-message ProtocolIE-ID ::= 797

id-CUtoDUTAInformation-List ProtocolIE-ID ::= 798

id-U2URLCChannelQoS ProtocolIE-ID ::= 799

id-SL-PHY-MAC-RLC-ConfigExt ProtocolIE-ID ::= 800

id-SLPositioning-Ranging-Service-Info ProtocolIE-ID ::= 801

id-TimeWindowInformation-SRS-List ProtocolIE-ID ::= 802

id-TimeWindowInformation-Measurement-List ProtocolIE-ID ::= 803

id-UL-RSCP ProtocolIE-ID ::= 804

id-BW-Aggregation-Request-Indication ProtocolIE-ID ::= 805

id-ReportingGranularitykminus1 ProtocolIE-ID ::= 806

id-ReportingGranularitykminus2 ProtocolIE-ID ::= 807

id-ReportingGranularitykminus1additionalpath ProtocolIE-ID ::= 808

id-ReportingGranularitykminus2additionalpath ProtocolIE-ID ::= 809

id-TimingReportingGranularityFactorExtended ProtocolIE-ID ::= 810

id-SRSPosRRCInactiveValidityAreaConfig ProtocolIE-ID ::= 811

id-PosValidityAreaCellList ProtocolIE-ID ::= 812

id-SRSReservationType ProtocolIE-ID ::= 813

id-SymbolIndex ProtocolIE-ID ::= 814

id-PRSBandwidthAggregationRequestIndication ProtocolIE-ID ::= 815

id-AggregatedPosSRSResourceIDList ProtocolIE-ID ::= 816

id-AggregatedPRSResourceSetList ProtocolIE-ID ::= 817

id-PhaseQuality ProtocolIE-ID ::= 818

id-MeasuredFrequencyHops ProtocolIE-ID ::= 819

id-TxHoppingConfiguration ProtocolIE-ID ::= 820

id-ReportingGranularitykminus3 ProtocolIE-ID ::= 821

id-ReportingGranularitykminus4 ProtocolIE-ID ::= 822

id-ReportingGranularitykminus5 ProtocolIE-ID ::= 823

id-ReportingGranularitykminus6 ProtocolIE-ID ::= 824

id-ReportingGranularitykminus3additionalpath ProtocolIE-ID ::= 825

id-ReportingGranularitykminus4additionalpath ProtocolIE-ID ::= 826

id-ReportingGranularitykminus5additionalpath ProtocolIE-ID ::= 827

id-ReportingGranularitykminus6additionalpath ProtocolIE-ID ::= 828

id-AggregatedPosSRSResourceSetList ProtocolIE-ID ::= 829

id-RequestedSRSPreconfigurationCharacteristics-List ProtocolIE-ID ::= 830

id-SRSPreconfiguration-List ProtocolIE-ID ::= 831

id-SRSInformation ProtocolIE-ID ::= 832

id-ValidityAreaSpecificSRSInformation ProtocolIE-ID ::= 833

id-EarlySyncServingCellInformation ProtocolIE-ID ::= XXX

//////////////////////////////////////////////////////////////irrelevant operations skipped/////////////////////////////////////////////////////////////////////