**3GPP TSG-RAN WG3 Meeting #114bis-e *R3-222540***

**Online, 17th – 26th January, 2022**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.423** | **CR** | **0620** | **rev** | **8** | **Current version:** | **16.8.0** |  |
|  |
| *For* [***HELP***](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 |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of Enhanced IIoT support over Xn |
|  |  |
| ***Source to WG:*** | Ericsson, Samsung, Huawei, ZTE,CATT, Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | RAN3 |
|  |  |
| ***Work item code:*** | NR\_IIOT\_URLLC\_enh-Core |  | ***Date:*** | 2022-02-23 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | New QoS related parameters are agreed in Rel 17 for the further enhanced NR-IIoT. |
|  |  |
| ***Summary of change:*** | Include the new QoS related parameters over XnAP |
|  |  |
| ***Consequences if not approved:*** | There is no support for the new Rel 17 QoS related parameters. |
|  |  |
| ***Clauses affected:*** | 9.2.3.115, 9.2.x.y, ASN.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.413 CR 0598TS 38.463 CR 0609 TS 38.473 CR 0751  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Rev 3: Including the agreed TP in R3-213774 to correctRev 4: rebase to 16.7.0Rev 5: Including TP from R3-215954 and R3-215979Rev 8: Correct the max value of the Survival Time IE has an extra ‘0’ in both tabular and asn.1 |

### 8.2.1 Handover Preparation

#### 8.2.1.1 General

This procedure is used to establish necessary resources in an NG-RAN node for an incoming handover. If the procedure concerns a conditional handover, parallel transactions are allowed. Possible parallel requests are identified by the target cell ID when the source UE AP IDs are the same.

The procedure uses UE-associated signalling.

#### 8.2.1.2 Successful Operation



Figure 8.2.1.2-1: Handover Preparation, successful operation

The source NG-RAN node initiates the procedure by sending the HANDOVER REQUEST message to the target NG-RAN node. When the source NG-RAN node sends the HANDOVER REQUEST message, it shall start the timer TXnRELOCprep.

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If the *Estimated Arrival Probability* IE is contained in the *Conditional Handover Information Request* IE included in the HANDOVER REQUEST message, then the target NG-RAN node may use the information to allocate necessary resources for the incoming CHO.

If the *IAB Node Indication* IE is contained in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, consider that the handover is for an IAB node.

If the *UE Radio Capability ID* IE is contained in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [7] and TS 23.502 [13].

If the *Time Synchronisation Assistance Information* IE is contained in the HANDOVER REQUEST message, the target NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [7].

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### 8.2.4 Retrieve UE Context

#### 8.2.4.1 General

The purpose of the Retrieve UE Context procedure is to either retrieve the UE context from the old NG-RAN node and transfer it to the NG-RAN node where the UE RRC Connection has been requested to be established, or to enable the old NG-RAN node to forward an RRC message to the UE via the new NG-RAN node without context transfer.

The procedure uses UE-associated signalling.

#### 8.2.4.2 Successful Operation



Figure 8.2.4.2-1: Retrieve UE Context, successful operation

The new NG-RAN node initiates the procedure by sending the RETRIEVE UE CONTEXT REQUEST message to the old NG-RAN node.

If the old NG-RAN node is able to identify the UE context by means of the UE Context ID, and to successfully verify the UE by means of the integrity protection contained in the RETRIEVE UE CONTEXT REQUEST message, and decides to provide the UE context to the new NG-RAN node, it shall respond to the new NG-RAN node with the RETRIEVE UE CONTEXT RESPONSE message.

If the *Index to RAT/Frequency Selection Priority* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new NG-RAN node shall store this information and use it as defined in TS 23.501 [7].

If the *Location Reporting Information* IE is included in the RETRIEVE UE CONTEXT RESPONSE message, then the new NG-RAN node should initiate the requested location reporting functionality as defined in TS 38.413 [5].

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In case of RRC Re-establishment, the old NG-RAN may include the *UE History Information* IE or the *UE History Information from the UE* IE in the RETRIEVE UE CONTEXT RESPONSE message. Upon reception of the *UE History Information* IE or the *UE History Information from the UE* IE in the RETRIEVE UE CONTEXT RESPONSE message, the new NG-RAN node shall, if supported, store the collected information and use it for future handover preparations.

If the *UE Radio Capability ID* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new NG- RAN node shall, if supported store this information in the UE context and use it as defined in TS 23.501 [7] and TS 23.502 [13].

If the *Time Synchronisation Assistance Information* IE is contained in the RETRIEVE UE CONTEXT RESPONSE message, the new NG-RAN node shall, if supported, store this information in the UE context and use it as defined in TS 23.501 [7].

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#### 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 ID9.2.3.16 | 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 ID9.2.3.26 | Allocated at the AMF on the source NG-C connection. | – |  |
| >Signalling TNL association address at source NG-C side | M |  | CP Transport Layer Information9.2.3.31 | 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 |  | – |  |
| >ManagementBasedMDT PLMN List | O |  | MDT PLMN List9.2.3.133 |  | YES | ignore |
| >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 |
| >UE Radio Capability ID | O |  | 9.2.3.138 |  | YES | reject |
| 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 ID9.2.3.16 |  | – |  |
| **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 ID9.2.3.16 | 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 |
| Time Synchronisation Assistance Information  | O |  | 9.2.3.aaa |  | YES | ignore |

|  |  |
| --- | --- |
| 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. |

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#### 9.1.1.9 RETRIEVE UE CONTEXT RESPONSE

This message is sent by the old NG-RAN node to transfer the UE context to the new NG-RAN node.

Direction: old NG-RAN node → new 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 |
| New NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID9.2.3.16 | Allocated at the new NG-RAN node | YES | ignore |
| Old NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID9.2.3.16 | Allocated at the old NG-RAN node | YES | ignore |
| GUAMI | M |  | 9.2.3.24 |  | YES | reject |
| UE Context Information – Retrieve UE Context Response | M |  | 9.2.1.13 |  | YES | reject |
| Trace Activation | O |  | 9.2.3.55 |  | YES | ignore |
| Masked IMEISV | O |  | 9.2.3.32 |  | YES | ignore |
| Location Reporting Information | O |  | 9.2.3.47 | Includes the necessary parameters for location reporting. | YES | ignore |
| Criticality Diagnostics | O |  | 9.2.3.3 |  | YES | ignore |
| 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 |
| UE History Information | O |  | 9.2.3.64 |  | YES | ignore |
| UE History Information from the UE | O |  | 9.2.3.110 |  | YES | ignore |
| ManagementBasedMDT PLMN List | O |  | MDT PLMN List9.2.3.133 |  | YES | Ignore |
| Time Synchronisation Assistance Information  | O |  | 9.2.3.aaa |  | YES | ignore |

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

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#### 9.2.3.115 TSC Assistance Information

This IE provides the TSC assistance information for a TSC QoS flow in the uplink or downlink (see TS 23.501 [7]).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Periodicity | M |  | 9.2.3.116 | Periodicity as specified in TS 23.501 [7]. | \_ |  |
| Burst Arrival Time | O |  | 9.2.3.117 | Burst Arrival Time as specified in TS 23.501 [7]. | \_ |  |
| Survival Time | O |  | 9.2.3.xxx |  | YES | ignore |

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#### 9.2.3.xxx Survival Time

This IE provides the Survival Time for a TSC QoS flow (see TS 23.501 [7]).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Survival Time | M |  | INTEGER (0..1920000, …) | Expressed in units of 1 us. |

#### 9.2.3.aaa Time Synchronisation Assistance Information

This IE indicates the 5G access stratum time distribution parameters as specified in TS 23.501 [7].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Time Distribution indication | M |  | ENUMERATED(enabled, disabled, …) |  |
| Uu Time Synchronization Error Budget | C-ifEnabled |  | INTEGER (0..1000000, …) | Expressed in units of 1 ns. |

|  |  |
| --- | --- |
| Condition | Explanation |
| C-ifEnabled | This IE shall be present if the *Time Distribution Indication* IE is set to “enabled”. |

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### 9.3.4 PDU Definitions

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 IABNodeIndication,

 SNTriggered,

 SCGIndicator,

 UESpecificDRX,

 TimeSynchronizationAssistanceInformation

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 id-IABNodeIndication,

 id-UERadioCapabilityID,

 id-SCGIndicator,

 id-UESpecificDRX,

 id-PDUSessionExpectedUEActivityBehaviour,

 id-TimeSynchronizationAssistanceInformation,

 maxnoofCellsinNG-RANnode,

 maxnoofDRBs,

 maxnoofPDUSessions,

 maxnoofQoSFlows

FROM XnAP-Constants;

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

--

-- 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-TimeSynchronizationAssistanceInformation CRITICALITY ignore TYPE TimeSynchronizationAssistanceInformation PRESENCE optional },

 ...

}

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-- RETRIEVE UE CONTEXT RESPONSE

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

RetrieveUEContextResponse ::= SEQUENCE {

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

 ...

}

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

 { ID id-newNG-RANnodeUEXnAPID CRITICALITY ignore TYPE NG-RANnodeUEXnAPID PRESENCE mandatory}|

 { ID id-oldNG-RANnodeUEXnAPID CRITICALITY ignore TYPE NG-RANnodeUEXnAPID PRESENCE mandatory}|

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

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

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

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

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

 { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics 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-UEHistoryInformation CRITICALITY ignore TYPE UEHistoryInformation PRESENCE optional}|

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

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

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

 ...

}

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### 9.3.5 Information Element definitions

-- ASN1START

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--

-- Information Element Definitions

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

XnAP-IEs {

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

ngran-access (22) modules (3) xnap (2) version1 (1) xnap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-CNTypeRestrictionsForEquivalent,

 id-CNTypeRestrictionsForServing,

 id-Additional-UL-NG-U-TNLatUPF-List,

 id-ConfiguredTACIndication,

 id-AlternativeQoSParaSetList,

 id-CurrentQoSParaSetIndex,

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 id-QoSFlowsMappedtoDRB-SetupResponse-MNterminated,

 id-DL-scheduling-PDCCH-CCE-usage,

 id-UL-scheduling-PDCCH-CCE-usage,

 id-SFN-Offset,

 id-SurvivalTime,

 id-QoS-Mapping-Information,

 id-AdditionLocationInformation,

 id-dataForwardingInfoFromTargetE-UTRANnode,

 id-Cause,

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-- S

SecondarydataForwardingInfoFromTarget-Item::= SEQUENCE {

 secondarydataForwardingInfoFromTarget DataForwardingInfoFromTargetNGRANnode,

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

 ...

}

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

 ...

}

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SUL-Information ::= SEQUENCE {

 sulFrequencyInfo NRARFCN,

 sulTransmissionBandwidth NRTransmissionBandwidth,

 iE-Extensions ProtocolExtensionContainer { {SUL-Information-ExtIEs} } OPTIONAL,

 ...

}

SUL-Information-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 { ID id-CarrierList CRITICALITY ignore EXTENSION NRCarrierList PRESENCE optional }|

 { ID id-FrequencyShift7p5khz CRITICALITY ignore EXTENSION FrequencyShift7p5khz PRESENCE optional },

...

}

SupportedSULBandList ::= SEQUENCE (SIZE(1..maxnoofNRCellBands)) OF SupportedSULBandItem

SupportedSULBandItem ::= SEQUENCE {

 sulBandItem SUL-FrequencyBand,

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

 ...

}

SupportedSULBandItem-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

SurvivalTime ::= INTEGER (0..1920000, ...)

SymbolAllocation-in-Slot ::= CHOICE {

 allDL SymbolAllocation-in-Slot-AllDL,

 allUL SymbolAllocation-in-Slot-AllUL,

 bothDLandUL SymbolAllocation-in-Slot-BothDLandUL,

 choice-extension ProtocolIE-Single-Container { {SymbolAllocation-in-Slot-ExtIEs} }

}

SymbolAllocation-in-Slot-ExtIEs XNAP-PROTOCOL-IES ::= {

 ...

}

SymbolAllocation-in-Slot-AllDL ::= SEQUENCE {

 iE-Extension ProtocolExtensionContainer { {SymbolAllocation-in-Slot-AllDL-ExtIEs} } OPTIONAL,

 ...

}

SymbolAllocation-in-Slot-AllDL-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

SymbolAllocation-in-Slot-AllUL ::= SEQUENCE {

 iE-Extension ProtocolExtensionContainer { {SymbolAllocation-in-Slot-AllUL-ExtIEs} } OPTIONAL,

 ...

}

SymbolAllocation-in-Slot-AllUL-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

SymbolAllocation-in-Slot-BothDLandUL ::= SEQUENCE {

 numberofDLSymbols INTEGER (0..13),

 numberofULSymbols INTEGER (0..13),

 iE-Extension ProtocolExtensionContainer { {SymbolAllocation-in-Slot-BothDLandUL-ExtIEs} } OPTIONAL,

 ...

}

SymbolAllocation-in-Slot-BothDLandUL-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- T

TABasedMDT ::= SEQUENCE {

 tAListforMDT TAListforMDT,

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

 ...

}

TABasedMDT-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

TAIBasedMDT ::= SEQUENCE {

 tAIListforMDT TAIListforMDT,

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

 ...

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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TSCTrafficCharacteristics ::= SEQUENCE {

 tSCAssistanceInformationDownlink TSCAssistanceInformation OPTIONAL,

 tSCAssistanceInformationUplink TSCAssistanceInformation OPTIONAL,

 ie-Extension ProtocolExtensionContainer { {TSCTrafficCharacteristics-ExtIEs} } OPTIONAL,

 ...

}

TSCTrafficCharacteristics-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

TSCAssistanceInformation ::= SEQUENCE {

 periodicity INTEGER (0.. 640000, ...),

 burstArrivalTime OCTET STRING OPTIONAL,

 ie-Extension ProtocolExtensionContainer { { TSCAssistanceInformation-ExtIEs} } OPTIONAL,

 ...

}

TSCAssistanceInformation-ExtIEs XNAP-PROTOCOL-EXTENSION ::=

{ ID id-SurvivalTime CRITICALITY ignore EXTENSION SurvivalTime PRESENCE optional},

 ...

}

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Threshold-RSRQ ::= INTEGER(0..34)

Threshold-RSRP ::= INTEGER(0..97)

Threshold-SINR ::= INTEGER(0..127)

TimeSynchronizationAssistanceInformation ::= SEQUENCE {

 timeDistributionIndication ENUMERATED {enabled, disabled, ...},

 uuTimeSynchronizationErrorBudget INTEGER (0..1000000, ...) OPTIONAL,

 -- The above IE shall be present if the Time Distribution Indication IE is set to the value “enabled”

 ie-Extension ProtocolExtensionContainer { { TimeSynchronizationAssistanceInformation-ExtIEs} } OPTIONAL,

 ...

}

TimeSynchronizationAssistanceInformation-ExtIEs XNAP-PROTOCOL-EXTENSION ::= {

 ...

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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### 9.3.7 Constant definitions

-- ASN1START

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

--

-- Constant definitions

--

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

XnAP-Constants {

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

ngran-Access (22) modules (3) xnap (2) version1 (1) xnap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 ProcedureCode,

 ProtocolIE-ID

FROM XnAP-CommonDataTypes;

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

--

-- Elementary Procedures

--

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

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id-pdcpDuplicationConfiguration ProtocolIE-ID ::= 235

id-duplicationActivation ProtocolIE-ID ::= 236

id-NPRACHConfiguration ProtocolIE-ID ::= 237

id-QosMonitoringReportingFrequency ProtocolIE-ID ::= 238

id-QoSFlowsMappedtoDRB-SetupResponse-MNterminated ProtocolIE-ID ::= 239

id-DL-scheduling-PDCCH-CCE-usage ProtocolIE-ID ::= 240

id-UL-scheduling-PDCCH-CCE-usage ProtocolIE-ID ::= 241

id-SFN-Offset ProtocolIE-ID ::= 242

id-QoSMonitoringDisabled ProtocolIE-ID ::= 243

id-ExtendedUEIdentityIndexValue ProtocolIE-ID ::= 244

id-PagingeDRXInformation ProtocolIE-ID ::= 245

id-CHO-MRDC-EarlyDataForwarding ProtocolIE-ID ::= 246

id-SCGIndicator ProtocolIE-ID ::= 247

id-UESpecificDRX ProtocolIE-ID ::= 248

id-PDUSessionExpectedUEActivityBehaviour ProtocolIE-ID ::= 249

id-QoS-Mapping-Information ProtocolIE-ID ::= 250

id-AdditionLocationInformation ProtocolIE-ID ::= 251

id-dataForwardingInfoFromTargetE-UTRANnode ProtocolIE-ID ::= 252

id-SurvivalTime ProtocolIE-ID ::= 2xx

id-TimeSynchronizationAssistanceInformation ProtocolIE-ID ::= 2xx+1

END

-- ASN1STOP