**3GPP TSG-RAN WG3 Meeting #112-e R3-21xxxx**

**Online, 17 May – 28 May 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.423** | **CR** | **0530** | **rev** | **5** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Correction on the DRX information delivery for RRC\_INACTIVE UE in XnAP | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE, Qualcomm Incorporated, Ericsson, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_eMTC5-Core,  LTE\_5GCN\_connect-Core, NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2021-05-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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 can be 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:*** | | 1. It is unclear which Paging DRX value is sent in RAN Paging message in the case where the eDRX is not configured or is configured. 2. The DRX cycle (T) used for the dertermination of Paging subframe, PNB and GWUS resource may be different from that used for the dertermination of Paging radio frame for UE in RRC\_INACTIVE, in which case the paging eNB should know the UE specific DRX. Also, the additional POs monitored by the UE inside the PTW are not known by a paging node if the UE supports eDRX in RRC inactive state. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Clarify the *Paging DRX* IE contains the RAN paging cycle. 2. Include *UE Specific DRX* and *Paging eDRX Information* IEs in the RAN PAGING message.   **Impact Analysis**  Impacted functionality:  This CR has an isolated impact towards the previous version of the specification (same release).  This CR only has an impact on the Paging function for UE in RRC\_INACTIVE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | If shortest of the RAN paging cycle and the UE specific paging cycle is provided as the *Paging DRX* IE in XnAP: RAN PAGING message, in case RAN Paging cycle is larger than the UE specific paging cycle, RAN paging loss may occur in some cases, e.g. eDRX is configured by higher layers.  UE’s paging occasions are under-used in RRC\_INACTIVE, particularly if the PTW is long. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.2.5, 9.1.1.7, 9.2.3.66, 9.2.3.xz(new), 9.2.3.xy (new), ASN.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Rev0: R3-210206  Rev1: R3-211041  Rev2: R3-211056  Rev3: R3-211315  Rev4: R3-211593 | | | | | | | | |

*Start of the first change*

8.2.5 RAN Paging

8.2.5.1 General

The purpose of the RAN Paging procedure is to enable the NG-RAN node1 to request paging of a UE in the NG-RAN node2.

The procedure uses non UE-associated signalling.

8.2.5.2 Successful operation

****

**Figure 8.2.5.2-1: RAN Paging: successful operation**

The RAN Paging procedure is triggered by the NG-RAN node1 by sending the RAN PAGING message to the NG-RAN node2,in which the necessary information e.g. UE RAN Paging Identity should be provided.

If the *Paging Priority* IE is included in the RAN PAGING message, the NG-RAN node2 may use it to prioritize paging.

If the *Assistance Data for RAN Paging* IE is included in the RAN PAGING message, the NG-RAN node2 may use it according to TS 38.300 [9].

If the *UE Radio Capability for Paging* IE is included in the RAN PAGING message, the NG-RAN node2 may use it to apply specific paging schemes.

When available, the NG-RAN node1 shall include the *UE Specific DRX* IE in the RAN PAGING message towards the NG-RAN node2. If the *UE specific DRX* IE is included in the RAN PAGING message, the NG-RAN node2 shall, if supported, use it according to TS 36.304 [34].

If the *Paging eDRX Information* IE is included in the RAN PAGING message, the NG-RAN node2 shall, if supported, use it according to TS 36.304 [34].

8.2.5.3 Unsuccessful Operation

Not applicable.

8.2.5.4 Abnormal Condition

Void.

*Next change*

9.1.1.7 RAN PAGING

This message is sent by the NG-RAN node1 to NG-RAN node2 to page a UE.

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 |
| CHOICE *UE Identity Index Value* | M |  |  |  | YES | reject |
| *>Length-10* |  |  |  |  |  |  |
| >>Index Length-10 | M |  | BIT STRING (SIZE(10)) | Coded as specified in TS 38.304 [33] and TS 36.304 [34]. | – |  |
| UE RAN Paging Identity | M |  | 9.2.3.43 |  | YES | ignore |
| Paging DRX | M |  | 9.2.3.66 | Includes the RAN paging cycle as defined in TS 36.304 [34] and 38.304 [33]. | YES | ignore |
| RAN Paging Area | M |  | 9.2.3.38 |  | YES | reject |
| Paging Priority | O |  | 9.2.3.44 |  | YES | ignore |
| Assistance Data for RAN Paging | O |  | 9.2.3.41 |  | YES | ignore |
| UE Radio Capability for Paging | O |  | 9.2.3.91 |  | YES | ignore |
| UE specific DRX | O |  | 9.2.3.xy | Includes the UE specific DRX as received in the *Core Network Assistance Information* IE in TS 38.413 [5]. | YES | ignore |
| Paging eDRX Information | O |  | 9.2.3.xz |  | YES | ignore |

*Next change*

#### 9.2.3.66 Paging DRX

This IE indicates the RAN paging cycle as defined in TS 38.304 [33] and TS 36.304 [34].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| Paging DRX | M |  | ENUMERATED (32, 64, 128, 256, ... , 512, 1024) |  |

9.2.3.xz Paging eDRX Information

This IE indicates the Paging eDRX parameters for RRC\_IDLE as defined in TS 36.304 [33], if configured by higher layers.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Paging eDRX Cycle | M |  | ENUMERATED (hfhalf, hf1, hf2, hf4, hf6, hf8, hf10, hf12, hf14, hf16, hf32, hf64, hf128, hf256, …) | TeDRX defined in TS 36.304 [34]. Unit: [number of hyperframes]. |
| Paging Time Window | O |  | ENUMERATED  (s1, s2, s3, s4, s5, s6, s7, s8, s9, s10, s11, s12, s13, s14, s15, s16, …) | Unit: [1.28 second]. |

*Next change*

#### 9.2.3.xy UE Specific DRX

This IE indicates the UE specific paging cycle as defined in TS 36.304 [34] and 38.304 [33].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| UE Specific DRX | M |  | ENUMERATED (32, 64, 128, 256, …) |  |

*Next change*

9.3.4 PDU Definitions

-- ASN1START

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

--

-- PDU definitions for XnAP.

--

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

//SKIP THE UNRELATED PART//

SNTriggered,

UESpecificDRX,

PagingeDRXInformation,

//SKIP THE UNRELATED PART//

id-UERadioCapabilityID,

id-UESpecificDRX,

id-PagingeDRXInformation,

//SKIP THE UNRELATED PART//

*Next change*

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

--

-- RAN PAGING

--

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

RANPaging ::= SEQUENCE {

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

...

}

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

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

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

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

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

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

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

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

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

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

...

}

*Next change*

9.3.5 Information Element definitions

//SKIP THE UNRELATED PART//

-- P

PacketDelayBudget ::= INTEGER (0..1023, ...)

PacketErrorRate ::= SEQUENCE {

pER-Scalar PER-Scalar,

pER-Exponent PER-Exponent,

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

...

}

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

...

}

PedestrianUE ::= ENUMERATED {

authorized,

not-authorized,

...

}

PagingeDRXInformation ::= SEQUENCE {

paging-eDRX-Cycle Paging-eDRX-Cycle,

paging-Time-Window Paging-Time-Window OPTIONAL,

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

...

}

PagingeDRXInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

...

}

Paging-eDRX-Cycle ::= ENUMERATED {

hfhalf, hf1, hf2, hf4, hf6,

hf8, hf10, hf12, hf14, hf16,

hf32, hf64, hf128, hf256,

...

}

Paging-Time-Window ::= ENUMERATED {

s1, s2, s3, s4, s5,

s6, s7, s8, s9, s10,

s11, s12, s13, s14, s15, s16,

...

}

PER-Scalar ::= INTEGER (0..9, ...)

PER-Exponent ::= INTEGER (0..9, ...)

//SKIP THE UNRELATED PART//

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

...

}

UESpecificDRX ::= ENUMERATED {

v32,

v64,

v128,

v256,

...

}

ULConfiguration::= SEQUENCE {

uL-PDCP UL-UE-Configuration,

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

...

}

*Next change*

### 9.3.7 Constant definitions

//SKIP THE UNRELATED PART//

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

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

id-UESpecificDRX ProtocolIE-ID ::= 24x

id-PagingeDRXInformation ProtocolIE-ID ::= 24y

END

-- ASN1STOP

*End of the change*