**3GPP TSG-RAN WG2 Meeting #113-bis-e *R2-210xxxx***

**E-meeting, 12th – 20th April 2021**

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| *CR-Form-v11.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.331** | **CR** | **xxx** | **rev** | **-** | **Current version:** | **16.4.0** |  |
|  | | | | | | | | |
| *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 | **x** | Radio Access Network | **x** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | CR on RRC processing delay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE Corporation, Sanechips | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | | ***Date:*** | | 2021-04-20 |
|  |  | | | |  | | |  | |  |
| ***Category:*** | **F** |  | | | | | | ***Release:*** | | Rel-15 |
|  | *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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Inter-RAT handover from NR to E-UTRAN has been supported since Release 15. However, the corresponding RRC processing delay of this procedure is missing in TS 36.331. Based on RAN4 spec, the RRC processing delay is defined in TS 38.133, so this CR is to add the reference for this scenario. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. In section 11.2, add “and TS 38.133 [84] in case of handover from NR.” to Handover to E-UTRAN row.   **mpact analysis**  Impacted 5G architecture options:  NR SA, EN-DC  Impacted functionality:  RRC processing delay  Inter-operability:   1. If UE implementates according to the CR and the network is not, or if the network implementates according to the CR and the UE is not, UE and network may have different understanding of the RRC processing delay for indentified scenarios. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The RRC processing delay for inter-RAT handover from NR to E-UTRAN is unspecified in RAN2 spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 11.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 | | | CR | | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

Start of change

11.2 Processing delay requirements for RRC procedures

The UE performance requirements for RRC procedures are specified in the following tables, by means of a value N:

N = the number of 1ms subframes from the end of reception of the E-UTRAN -> UE message on the UE physical layer up to when the UE shall be ready for the reception of uplink grant for the UE -> E-UTRAN response message with no access delay other than the TTI-alignment (e.g. excluding delays caused by scheduling, the random access procedure or physical layer synchronisation).

NOTE: No processing delay requirements are specified for RN-specific procedures.

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**Figure 11.2-1: Illustration of RRC procedure delay**

**Table 11.2-1: UE performance requirements for RRC procedures for UEs other than NB-IoT UEs**

| **Procedure title:** | **E-UTRAN -> UE** | **UE -> E-UTRAN** | **N** | **Notes** |
| --- | --- | --- | --- | --- |
| **RRC Connection Control Procedures** | | | | |
| RRC connection establishment | *RRCConnectionSetup or RRCConnectionResume* | *RRCConnectionSetupComplete or RRCConnectionResumeComplete* | 15 or 3 | N = 3 applies for the case of reception of *RRCConnectionResume* if *reducedCP-LatencyEnabled* is configured, the UE supports reduced CP latency, and the RRC message only includes MAC and PHY (re-)configurations and does not include (re-)configurations of DRX, SPS, SCells, and MIMO. Further, the UL grant is sent using PDCCH DCI format 0 in common search space. In this scenario, the RRC procedure delay can extend beyond the reception of the UL grant, up to 7 ms.  For other cases N = 15 applies. |
| RRC connection release | *RRCConnectionRelease* |  | NA |  |
| RRC connection re-configuration (radio resource configuration, possibly including configuration of conditional reconfigurations) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 15 | Same requirement is applicable regardless of the number of target candidates being configured, if conditional reconfigurations are included in the message, |
| RRC connection re-configuration (measurement configuration) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 15 |  |
| RRC connection re-configuration (intra-LTE mobility) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 15 |  |
| RRC connection reconfiguration (SCell addition/release) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 20 |  |
| RRC connection reconfiguration (SCG establishment/ release, SCG cell addition/ release) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 20 |  |
| RRC connection re-configuration (NR measurement configuration) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 15 |  |
| RRC connection reconfiguration (NR SCG establishment/ /modification/release) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 20 |  |
| RRC connection re-configuration (intra-LTE mobility with NR SCG establishment/ /modification/release) | *RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 20 |  |
| RRC connection re-configuration | *DLDedicatedMessageSegment* | *RRCConnectionReconfigurationComplete* | 20+( Nseg  -1)\*10 | Nseg  is number of RRC segments |
| RRC connection re-establishment | *RRCConnectionReestablishment* | *RRCConnectionReestablishmentComplete* | 15 |  |
| Initial security activation | *SecurityModeCommand* | *SecurityModeCommandComplete/SecurityModeCommandFailure* | 10 |  |
| Initial security activation + RRC connection re-configuration (RB establishment) | *SecurityModeCommand, RRCConnectionReconfiguration* | *RRCConnectionReconfigurationComplete* | 20 | The two DL messages are transmitted in the same TTI |
| EDT or transmission using PUR | *RRCEarlyDataComplete* or *RRCConnectionRelease* |  | NA |  |
| Paging | *Paging* |  | NA |  |
| RRC connection resume (SCG establishment/ restoration/release) | *RRCConnectionResume* | *RRCConnectionResumeComplete* | 20 |  |
| RRC connection resume (MCG SCell addition/restoration/release) | *RRCConnectionResume* | *RRCConnectionResumeComplete* | 20 |  |
| RRC connection resume | *DLDedicatedMessageSegment* | *RRCConnectionResumeComplete* | 20+( Nseg  -1)\*10 | Nseg  is number of RRC segments |
| **Inter RAT mobility** | | | | |
| Handover to E-UTRA | *RRCConnectionReconfiguration (sent by other RAT)* | *RRCConnectionReconfigurationComplete* | NA | The performance of this procedure is specified in TS 45.010 [50] in case of handover from GSM and TS 25.133 [29], TS 25.123 [30] in case of handover from UTRA, and TS 38.133 [84] in case of handover from NR. |
| Handover from E-UTRA | *MobilityFromEUTRACommand* |  | NA | The performance of this procedure is specified in TS 36.133 [16] |
| Handover from E-UTRA to CDMA2000 | *HandoverFromEUTRAPreparationRequest (CDMA2000)* |  | NA | Used to trigger the handover preparation procedure with a CDMA2000 RAT.  The performance of this procedure is specified in TS 36.133 [16] |
| **Measurement procedures** | | | | |
| Measurement Reporting |  | *MeasurementReport* | NA |  |
| **Other procedures** | | | | |
| UE capability transfer | *UECapabilityEnquiry* | *UECapabilityInformation* | 10/ 80 | N = 80 applies in case the UE has to report at least one of the following UE capabilities.  - MR-DC band combinations.  - NR band combinations  - EUTRA feature sets |
| Counter check | *CounterCheck* | *CounterCheckResponse* | 10 |  |
| Proximity indication |  | *ProximityIndication* | NA |  |
| UE information | *UEInformationRequest* | *UEInformationResponse* | 15 |  |
| MBMS counting | *MBMSCountingRequest* | *MBMSCountingResponse* | NA |  |
| MBMS interest indication |  | *MBMSInterestIndication* | NA |  |
| In-device coexistence indication |  | *InDeviceCoexIndication* | NA |  |
| UE assistance information |  | *UEAssistanceInformation* | NA |  |
| SCG failure information |  | *SCGFailureInformation* | NA |  |
| NR SCG failure information |  | *SCGFailureInformationNR* | NA |  |
| Sidelink UE information |  | *SidelinkUEInformation* | NA |  |
| WLAN Connection Status Reporting |  | *WLANConnectionStatusReport* | NA |  |
| PUR Configuration Request |  | *PURConfigurationRequest* | NA |  |

**Table 11.2-2: UE performance requirements for RRC procedures for NB-IoT UEs**

| **Procedure title:** | **E-UTRAN -> UE** | **UE -> E-UTRAN** | **N** | **Notes** |
| --- | --- | --- | --- | --- |
| **RRC Connection Control Procedures** | | | | |
| RRC connection establishment | *RRCConnectionSetup-NB or RRCConnectionResume-NB* | *RRCConnectionSetupComplete-NB or RRCConnectionResumeComplete-NB* | 45 |  |
| RRC connection release | *RRCConnectionRelease-NB* |  | NA |  |
| RRC connection re-configuration (radio resource configuration) | *RRCConnectionReconfiguration-NB* | *RRCConnectionReconfigurationComplete-NB* | 45 |  |
| RRC connection re-establishment | *RRCConnectionReestablishment-NB* | *RRCConnectionReestablishmentComplete-NB* | 45 |  |
| Initial security activation | *SecurityModeCommand* | *SecurityModeCommandComplete/SecurityModeCommandFailure* | 35 |  |
| Initial security activation + RRC connection re-configuration (RB establishment) | *SecurityModeCommand, RRCConnectionReconfiguration-NB* | *RRCConnectionReconfigurationComplete-NB* | 55 | The two DL messages are transmitted in the same TTI |
| EDT or transmission using PUR | *RRCEarlyDataComplete-NB* or *RRCConnectionRelease-NB* |  | NA |  |
| Paging | *Paging-NB* |  | NA |  |
| **Other procedures** | | | | |
| UE capability transfer | *UECapabilityEnquiry-NB* | *UECapabilityInformation-NB* | 35 |  |
| UE information | *UEInformationRequest-NB* | *UEInformationResponse-NB* | 45 |  |
| PUR Configuration Request |  | *PURConfigurationRequest-NB* | NA |  |

End of change