**3GPP TSG-RAN WG3 #115-e R3-222946**

**21th February –3rd March, 2022**

**Online**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.401** | **CR** | **0191** | **rev** | **3** | **Current version:** | **16.8.0** |  |
|  |
| *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:***  | Draft BL CR to TS 38.401 on RedCap UEs  |
|  |  |
| ***Source to WG:*** | CATT, Ericsson, Nokia, Nokia Shanghai Bell, ZTE, Samsung, Radisys |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_redcap-Core |  | ***Date:*** | 2022-03-04 |
|  |  |  |  |  |
| ***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:*** | The work item RP-211574 was agreed to support NR RedCap UEs. |
|  |  |
| ***Summary of change:*** | Introduce a NR RedCap UE Indication IE in the INITIAL UL RRC MESSAGE TRANSFER message. |
|  |  |
| ***Consequences if not approved:*** | No support of RedCap early identification in UE Initial Access |
|  |  |
| ***Clauses affected:*** | 8.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.473 CR 0806TS 38.413 CR 0664 |
| ***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 1: Resubmission to RAN3#114bis-eRev 2: Resubmission to RAN3#115-eRev 3: Merge the TP R3-222532 agreed in RAN3#115e  |

**<<<<<< START OF CHANGE >>>>>>**

8.1 UE Initial Access

The signalling flow for UE Initial access is shown in Figure 8.1-1.



Figure 8.1-1: UE Initial Access procedure

1. The UE sends an *RRCSetupRequest* message to the gNB-DU.

2. The gNB-DU includes the RRC message and, if the UE is admitted, the corresponding low layer configuration for the UE in the INITIAL UL RRC MESSAGE TRANSFER message and transfers to the gNB-CU. The INITIAL UL RRC MESSAGE TRANSFER message includes the C-RNTI allocated by the gNB-DU. If the gNB-DU identifies the UE as a Reduced Capability UE during the random access procedure, a NR RedCap UE Indication is provided in the INITIAL UL RRC MESSAGE TRANSFER message.

3. The gNB-CU allocates a gNB-CU UE F1AP ID for the UE and generates a *RRCSetup* message towards UE. The RRC message is encapsulated in -the DL RRC MESSAGE TRANSFER message.

4. The gNB-DU sends the *RRCSetup* message to the UE.

5. The UE sends the RRC CONNECTION SETUP COMPLETE message to the gNB-DU.

6. The gNB-DU encapsulates the RRC message in the UL RRC MESSAGE TRANSFER message and sends it to the gNB-CU.

7. The gNB-CU sends the INITIAL UE MESSAGE message to the AMF.

8. The AMF sends the INITIAL CONTEXT SETUP REQUEST message to the gNB-CU.

9. The gNB-CU sends the UE CONTEXT SETUP REQUEST message to establish the UE context in the gNB-DU. In this message, it may also encapsulate the *SecurityModeCommand* message. In case of NG-RAN sharing, the gNB-CU includes the serving PLMN ID (for SNPNs the serving SNPN ID).

10. The gNB-DU sends the *SecurityModeCommand* message to the UE.

11. The gNB-DU sends the UE CONTEXT SETUP RESPONSE message to the gNB-CU.

12. The UE responds with the *SecurityModeComplete* message

13. The gNB-DU encapsulates the RRC message in the UL RRC MESSAGE TRANSFER message and sends it to the gNB-CU.

14. The gNB-CU generates the *RRCReconfiguration* message and encapsulates it in the DL RRC MESSAGE TRANSFER message

15. The gNB-DU sends *RRCReconfiguration* message to the UE.

16. The UE sends *RRCReconfigurationComplete* message to the gNB-DU.

17. The gNB-DU encapsulates the RRC message in the UL RRC MESSAGE TRANSFER message and send it to the gNB-CU.

18. The gNB-CU sends the INITIAL CONTEXT SETUP RESPONSE message to the AMF.

**<<<<<<NEXT CHANGE >>>>>>**

8.7 RRC connection reestablishment

This procedure is used for the case that UE tries to reestablish the RRC connection, as shown in Figure 8.7-1.

****

**Figure 8.7-1: RRC connection reestablishment procedure**

1. The UE sends a preamble to the gNB-DU.

2. The gNB-DU allocates new C-RNTI and responds with RAR.

3. The UE sends an *RRCReestablishmentRequest* message to the gNB-DU, which contains old C-RNTI and old PCI.

4. The gNB-DU includes the RRC message and, if the UE is admitted, the corresponding low layer configuration for the UE in the INITIAL UL RRC MESSAGE TRANSFER message and transfers to the gNB-CU. The INITIAL UL RRC MESSAGE TRANSFER message includes the new C-RNTI. If the gNB-DU identifies the UE as a Reduced Capability UE during the random access procedure, a NR RedCap UE Indication is provided in the INITIAL UL RRC MESSAGE TRANSFER message.

5. The gNB-CU includes an *RRCReestablishment* message and transfers to the gNB-DU. If the UE requests to re-establish RRC connection in the last serving gNB-DU, the DL RRC MESSAGE TRANSFER message shall include old gNB-DU UE F1AP ID.

6. The gNB-DU retrieves the UE context based on the old gNB-DU UE F1AP ID, and replaces old C-RNTI/PCI with new C-RNTI/PCI. It sends the *RRCReestablishment* message to UE.

7-8. The UE sends an *RRCReestablishmentComplete* message to the gNB-DU. The gNB-DU encapsulates the RRC message in the UL RRC MESSAGE TRANSFER message and sends to the gNB-CU.

9-10. The gNB-CU triggers an UE Context Modification procedure by sending UE CONTEXT MODIFICIATION REQUEST message, which may include DRBs to be modified and released list. The gNB-DU responses with the UE CONTEXT MODIFICATION RESPONSE message.

9'-10'. The gNB-DU triggers an UE Context Modification procedure by sending UE CONTEXT MODIFICIATION REQUIRED message, which may include DRBs to be modified and released list. The gNB-CU responses with UE CONTEXT MODIFICATION CONFIRM message.

NOTE: Here it is assumed that the UE accessed the original gNB-DU where the UE context is available for that UE, and either steps 9-10 or steps 9’-10’ may be executed or both could be skipped.

NOTE: If the UE accessed from a gNB-DU other than the original one, the gNB-CU should trigger the UE Context Setup procedure toward this new gNB-DU.

11-12. The gNB-CU includes an *RRCReconfiguration* message into the DL RRC MESSAGE TRANSFER message and transfers to the gNB-DU. The gNB-DU forwards it to the UE.

13-14. The UE sends an *RRCReconfigurationComplete* message to the gNB-DU, and the gNB-DU forwards it to the gNB-CU.

**<<<<<< END OF CHANGES >>>>>>**