**3GPP TSG-RAN WG3 Meeting #116-e *R3-223871***

**E-meeting, 9-19 May, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.300** | **CR** | **-** | **rev** | **-** | **Current version:** | 17.0.0 |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:*** | Correction on RA-SDT overall procedures | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT, ZTE, Huawei, Ericsson, Nokia, Nokia Shanghai Bell, Google, China Telecom, LG Electronics, NEC, Intel Corporation | | | | | | | | | |
| ***Source to TSG:*** | RAN3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SmallData\_INACTIVE | | | | |  | ***Date:*** | | | 2022-05-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The overall procedures for SDT with/without anchor relocation are not clear enough, which may cause confusion or misunderstanding. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Refine the overall procedure, the figures and corresponding texts for RA-based SDT, including the RA-SDT without anchor relocation, and SDT with anchor relocation. | | | | | | | | |
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| ***Consequences if not approved:*** | | The overall procedures for SDT with/without anchor relocation are not clear enough, which may cause some confusion or misunderstanding. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 18.1, 18.2, 18.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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18.1 Support of SDT procedure over RACH

For SDT procedure over RACH, if the UE accesses a gNB other than the last serving gNB, the UL SDT data/signalling is buffered at the receiving gNB, and then the receiving gNB triggers the XnAP Retrieve UE Context procedure. The receiving gNB indicates SDT to the last serving gNB and the last serving gNB decides whether to relocate the UE context or not. Other SDT assistance information (e.g., single packet, multiple packets) may also be provided by the receiving gNB to help the decision of UE context relocation.

If the last serving gNB decides not to relocate the full UE context, it transfers a partial UE context containing SDT RLC context information necessary for the receiving gNB to handle SDT via the Partial UE Context Transfer procedure. Then,

* In case SDT is used for user data over DRBs, UL/DL tunnels are established for DRBs configured for SDT between the receiving gNB and the last serving gNB. The PDCP PDU of UL/DL data are transferred over the tunnels,
* In case SDT is used for signalling, SRB PDCP PDUs are transferred between the receiving gNB and the last serving gNB via the XnAP RRC Transfer procedure,

until the last serving gNB terminates the SDT session and moves the UE back to RRC\_INACTIVE by sending the *RRCRelease* message. During the SDT session, in case the receiving gNB detects that no more packets are to be transmitted, or radio link problem is detected, the receiving gNB may also request to terminate the SDT session to the last serving gNB via the UE Context Retrieve Confirmation procedure.

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## 18.2 SDT with UE context relocation

The overall procedure for SDT procedure over RACH with UE context relocation is illustrated in the figure 18.2-1.



Figure 18.2-1. RA-based SDT with UE context relocation

1. The UE sends an *RRCResumeRequest* as well as UL SDT data and/or UL SDT signalling to the receiving gNB.

2. The receiving gNB identifies the last serving gNB using the I-RNTI and retrieves the UE context by means of Xn-AP Retrieve UE Context procedure. The receiving gNB indicates that the UE request is for an SDT session and may also provide SDT assistance information (e.g., single packet, multiple packets).

3. The last serving gNB decides to relocate UE context and responds with the RETRIEVE UE CONTEXT RESPONSE message. The UL SDT data, if any, is delivered from the receiving gNB to the UPF.

4-6. The receiving gNB decides to keep UE in RRC\_INACTIVE state for SDT. If loss of DL user data buffered in the last serving gNB shall be prevented, the receiving gNB provides forwarding addresses via the Xn-U ADDRESS INDICATION message. The receiving gNB also initiates the NG-AP Path Switch procedure to establish a NG UE associated signalling connection to the serving AMF. After the Path Switch procedure, the buffered UL NAS PDU, if any, is delivered from the receiving gNB to the AMF. And then, the subsequent UL/DL SDT data and/or signalling are transferred between UE and core network via the receiving gNB.

NOTE: In case DL non-SDT data or DL non-SDT signalling arrives, or the UE assistance information (i.e. UL non-SDT data arrival indication) is received from the UE, the receiving gNB may decide to directly send the UE to RRC\_CONNECTED state by sending the *RRCResume* message.

7. After the SDT transmission is completed, the receiving gNB generates and sends the *RRCRelease* message including the Suspend Config to the UE to send the UE back to RRC\_INACTIVE state.

8. The receiving gNB indicates to the last serving gNB to remove the UE context by sending the XnAP UE CONTEXT RELEASE message. The XnAP UE CONTEXT RELEASE message can be sent after step 6.

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## 18.3 SDT without UE context relocation

The overall procedure for SDT procedure over RACH without UE context relocation is illustrated in the figure 18.3-1.



Figure 18.3-1. RA-based SDT without UE context relocation

1/2. The steps 1/2 are as defined in steps 1/2 in Figure 18.2-1.

3. The last serving gNB decides not to relocate the full UE context for SDT.

4. The last serving gNB transfers a partial UE context including the SDT related RLC context.

5. The receiving gNB acknowledges receiving the partial UE context and provides associated DL TNL address. The UE context is kept at the last serving gNB and the SDT related RLC context is established at the receiving gNB. Then UL/DL GTP-U tunnels are established for DRBs configured for SDT, if any, and the UL SDT data and/or signalling, if any, are forwarded to the last serving gNB, and then delivered to the core network.

NOTE 1: The DL signalling from the last serving gNB, if any, is forwarded to the receiving gNB via the RRC TRANSFER message, for which the receiving gNB delivers it to the UE.

NOTE 2: In case DL non-SDT data or DL non-SDT signalling arrives, or receives UE assistance information (i.e. UL non-SDT data arrival indication) from the UE, the last serving gNB moves the UE back to RRC\_INACTIVE state by sending the *RRCRelease* message.

6. The receiving gNB detects the end of SDT session and sends the RETRIEVE UE CONTEXT CONFIRM message including whether this is a “normal” end of SDT transaction or a radio link problem.

7. Upon receiving the RETRIEVE UE CONTEXT CONFIRM message and deciding to terminate the SDT, the last serving gNB responds to the receiving gNB with the RETRIEVE UE CONTEXT FAILURE message including an encapsulated *RRCRelease* message. The receiving gNB shall release the established partial UE context.

8. The receiving gNB sends the *RRCRelease* message to the UE.

9. The UE moves to RRC\_INACTIVE state if the Suspend Config is included in the *RRCRelease* message. Or else, the UE moves to RRC\_IDLE state.

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