**3GPP TSG-RAN2 Meeting #121 *R2-230xxxx***

**Athens, Greece, 27th February – 3rd March 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.321** | **CR** | 1569 | **rev** | **1** | **Current version:** | **17.3.0** |  |
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| *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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Correction to RA-SDT | | | | | | | | | |
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| ***Source to WG:*** | Google Inc. | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SmallData\_INACTIVE-Core | | | | |  | ***Date:*** | | | 2023-02-17 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
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| ***Reason for change:*** | | According to 38.321, the UE selects a set of Random Access rsources during a Random access proceudre.   |  | | --- | | 5.1 Random Access procedure5.1.1 Random Access procedure initialization <unrelated part omitted>  When a Random Access procedure is initiated, UE selects a set of Random Access resources as specified in clause 5.1.1b and initialises the following parameters for the Random Access procedure according to the values configured by RRC for the selected set of Random Access resources: |   As described in 38.331, the UE can initiate SDT only if all the conditions for initiating SDT are fulfilled. While checking whether all the conditions for initiating SDT are met, the UE has not selected Random Access resources yet because the UE has not initiated a Random Access procedure.   |  | | --- | | 5.3.13.1b Conditions for initiating SDT A UE in RRC\_INACTIVE initiates the resume procedure for SDT when all of the following conditions are fulfilled:  1> the upper layers request resumption of RRC connection; and  1> *SIB1* includes *sdt-ConfigCommon*; and  1> *sdt-Config* is configured; and  1> all the pending data in UL is mapped to the radio bearers configured for SDT; and  1> lower layers indicate that conditions for initiating SDT as specified in TS 38.321 [3] are fulfilled.  NOTE: How the UE determines that all pending data in UL is mapped to radio bearers configured for SDT is left to UE implementation. |   The “else if” condition check in section 5.27.1 describes that the UE selects a set of Random Access resources for perform RA-SDT according to section 5.1.1b. However, at this time point, the UE has not performed a Random Access procedure. Therefore, the UE should check whether a set of Random Access resources for RA-SDT is configured instead.   |  | | --- | | 5.27 Small Data Transmission5.27.1 General <unrelated part omitted>  2> else if a set of Random Access resources for performing RA-SDT are selected according to clause 5.1.1b on the selected UL carrier:  3> if *cg-SDT-TimeAlignmentTimer* is running, consider *cg-SDT-TimeAlignmentTimer* as expired and perform the corresponding actions in clause 5.2;  3> indicate to the upper layers that the conditions for initiating SDT procedure are fulfilled.  2> else:  3> indicate to the upper layers that the conditions for initiating SDT procedure are not fulfilled. | | | | | | | | | |
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| ***Summary of change:*** | | Change the “*else if*” statement to “*else if a set of Random Access resources for RA-SDT is configured and can be selected according to clause 5.1.1b* *on the selected UL carrier*”. | | | | | | | | |
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| ***Consequences if not approved:*** | | The text is confusing.  **Impact analysis**  Impacted functionality:  RA-SDT  Interoperability:  There is no interoperability foreseen because it has been agreed that the UE uses Random Acces resources for RA-SDT to perform RA-SDT, if configured, and otherwise, the UE does not initiate RA-SDT. | | | | | | | | |
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| ***Clauses affected:*** | | 5.27.1 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |

## 5.27 Small Data Transmission

### 5.27.1 General

The MAC entity may be configured by RRC with SDT and the SDT procedure may be initiated by RRC layer. The SDT procedure can be performed either by Random Access procedure with 2-step RA type or 4-step RA type (i.e., RA-SDT) or by configured grant Type 1 (i.e., CG-SDT).

RRC configures the following parameters for SDT procedure:

- *sdt-DataVolumeThreshold*: data volume threshold for the UE to determine whether to perform SDT procedure;

- *sdt-RSRP-Threshold*: RSRP threshold for UE to determine whether to perform SDT procedure;

- *cg-SDT-RSRP-ThresholdSSB*: an RSRP threshold configured for SSB selection for CG-SDT.

The MAC entity shall, if initiated by the upper layers for SDT procedure:

1> if the data volume of the pending UL data across all RBs configured for SDT is less than or equal to *sdt-DataVolumeThreshold*; and

NOTE: For SDT procedure, the MAC entity also considers the suspended RBs configured with SDT for data volume calculation. It is up to the UE's implementation how the UE calculates the data volume for the suspended RBs. Size of the CCCH message is not considered for data volume calculation

1> if the RSRP of the downlink pathloss reference is higher than *sdt-RSRP-Threshold*; or

1> if *sdt-RSRP-Threshold* is not configured:

2> if the Serving Cell is configured with supplementary uplink as specified in TS 38.331 [5]; and

2> if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:

3> select the SUL carrier.

2> else:

3> select the NUL carrier.

2> if CG-SDT is configured on the selected UL carrier, and TA for CG-SDT is valid according to clause 5.27.2 in the first available CG occasion for initial CG-SDT transmission with CCCH message according to clause 5.8.2; and

2> if, for each RB having data available for transmission, *configuredGrantType1Allowed*, if configured, is configured with value *true* for the corresponding logical channel; and

2> if at least one SSB configured for CG-SDT with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:

3> indicate to the upper layers that the conditions for initiating SDT procedure are fulfilled;

3> perform CG-SDT procedure on the selected UL carrier according to clause 5.8.2.

2> else if a set of Random Access resources for RA-SDT is configured and can be selected according to clause 5.1.1b on the selected UL carrier:

3> if *cg-SDT-TimeAlignmentTimer* is running, consider *cg-SDT-TimeAlignmentTimer* as expired and perform the corresponding actions in clause 5.2;

3> indicate to the upper layers that the conditions for initiating SDT procedure are fulfilled.

2> else:

3> indicate to the upper layers that the conditions for initiating SDT procedure are not fulfilled.

1> else:

2> indicate to the upper layers that the conditions for initiating SDT procedure are not fulfilled.

If RA-SDT is selected above and after the Random Access procedure is successfully completed (see clause 5.1.6), the UE monitors PDCCH addressed to C-RNTI received in random access response until the RA-SDT procedure is terminated. If CG-SDT is selected above and after the initial transmission for CG-SDT is performed, the UE monitors PDCCH addressed to C-RNTI as stored in UE Inactive AS context as specified in TS 38.331 [5] and CS-RNTI until the CG-SDT procedure is terminated.

/\* ================================ for information only ==================================\*/

### 5.1.1b Selection of the set of Random Access resources for the Random Access procedure

The MAC entity shall:

1> if the BWP selected for Random Access procedure is configured with both set(s) of Random Access resources with *msg3-Repetitions* set to *true* and set(s) of Random Access resources without *msg3-Repetitions* set to *true* and the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdMsg3*; or

1> if the BWP selected for Random Access procedure is only configured with the set(s) of Random Access resources with *msg3-Repetitions* set to *true*:

2> assume MSG3 repetition is applicable for the current Random Access procedure.

1> else:

2> assume MSG3 repetition is not applicable for the current Random Access procedure.

NOTE 1: Void.

1> if contention-free Random Access Resources have not been provided for this Random Access procedure and one or more of the features including RedCap and/or a specific NSAG(s) and/or SDT and/or MSG3 repetition is applicable for this Random Access procedure:

NOTE 2: The applicability of SDT is determined by MAC entity according to clause 5.27. The applicability of specific NSAG(s) is determined by upper layers when the Random Access procedure is initiated. The applicability of RedCap is also determined by upper layers when Random Access procedure is initiated and it is applicable to the Random Access procedures initiated by PDCCH orders and any Random Access procedure initiated by the MAC entity.

2> if none of the sets of Random Access resources are available for any feature applicable to the current Random Access procedure (as specified in clause 5.1.1c):

3> select the set(s) of Random Access resources that are not associated with any feature indication (as specified in clause 5.1.1c) for this Random Access procedure.

2> else if there is one set of Random Access resources available which can be used for indicating all features triggering this Random Access procedure:

3> select this set of Random Access resources for this Random Access procedure.

2> else (i.e. there are one or more sets of Random Access resources available that are configured with indication(s) for a subset of all features triggering this Random Access procedure):

3> select a set of Random Access resources from the available set(s) of Random Access resources based on the priority order indicated by upper layers as specified in clause 5.1.1d for this Random Access Procedure.

1> else if contention-free Random Access Resources have been provided for this Random Access procedure and RedCap is applicable for the current Random Access procedure and there is one set of Random Access resources available that is only configured with RedCap indication:

2> select this set of Random Access resources for this Random Access procedure.

1> else:

2> select the set of Random Access resources that are not associated with any feature indication (as specified in clause 5.1.1c) for the current Random Access procedure.