**3GPP TSG-RAN WG3 #120 R3-233330**

**22nd – 26th May 2023**

**Incheon, Korea**

Agenda Item: 20.2

Source: ZTE (moderator)

Title: Summary of Offline Discussion on CB: # R18SDT\_Solution

Document for: Approval

# Introduction

**CB: # R18SDT\_Solution**

**- Continue the discussion on open issues left**

**- Provide TPs based on the agreements**

(moderator - ZTE)

Summary of offline disc [R3-234534](Inbox%5CR3-234534.zip)

# For the Chairman’s Notes

**<TBD>**

# Discussion- Second round

**<TBD>**

# Discussion-First round

## Background

**RAN3 #120 progress**

**In E1AP: MT-SDT indicator IE within MT-SDT information IE is not needed.**

**In XnAP: MT-SDT data size calculation includes total of both SDT signalling and SDT user plane data. Try to capture it into the TP.**

**In XnAP: Both MT-SDT indicator IE and MT-SDT Data Size IE are “Mandatory”.**

**In F1AP: MT-SDT indicator IE is “Mandatory”.**

**In F1AP: gNB-CU makes the MT-SDT decision, gNB-DU shall follow the decision.**

**When new DL data is coming through non-SDT bearer, the gNB-CU-UP shall send DL DATA NOTIFICATION message.**

**FFS on either excluding MT-SDT Information, or introducing a new indicator (e.g., Non MT-SDT Data) or other method.**

**When large size of new DL data is coming through SDT bearer, the gNB-CU-UP shall send DL DATA NOTIFICATION message.**

**FFS on either excluding MT-SDT Information, or introducing a new indicator (e.g., MT-SDT Oversize), or other method.**

**FFS: How to calculate MT-SDT Data Size for SDT DL data packets.**

**RAN3 #121 progress**

**When a DL non-SDT data is coming, the gNB-CU-UP shall send DL DATA NOTIFICATION message, adding an explicit indicator to indicate that DL non-SDT data arrives.**

**To be continued...**

**When a large size of DL DT data is coming, the gNB-CU-UP shall send DL DATA NOTIFICATION message to indicate that large size of DL SDT data arrives. FFS on reusing the existing IE or new one.**

CATT, Nok, CT: Reusing the current DL DATA NOTIFICATION message is enough. What’s the behavior in the receiving node towards different cases？

HW: Agree p1

QC: Whether to send QFI or not?

ZTE: In R18, the indication can be used to differentiate the non-SDT data and large size SDT data

Lenovo: R18 is different with R17.

Nok: If this is non-SDT data, then UE needs to be sent to active mode, while for large size SDT data, UE may need to be sent to active mode.

An explicit indicator is needed, whether it is used to indicate non-SDT data and large size SDT data.

**DL SDT Data Size threshold shall be introduced in E1: Bearer Context Setup/ Modification message.**

CATT, CT: It’s not necessary to be sent, which can be configured by OAM, whether the threshold is node level or UE level

E///: In the multiple connected UP case, OAM based solution seems not feasible

Nok: Only CU-CP knows how to configure the threshold per UE, which is related with radio condition

## Discussion

**R17:**

**Proposal 1: When a DL non-SDT data or a large size of DL DT data is coming, the gNB-CU-UP shall send R17 DL DATA NOTIFICATION message, with legacy IE.**

**Proposal 2: No stage 3 impact, Stage 2 is needed as below**.

R3-233817 (38.300, ZTE, China Telecom, Huawei, Qualcomm Incorporated, Nokia, Nokia Shanghai Bell, Lenovo, CATT, Ericsson, Xiaomi)

*Moderator: During offline with LG, since in R17, we do not want to enhance DL DATA NOTIFICATION messsae, it is by RAN implementation to define the large size of SDT data/signalling, it implies the gNB can send R17 DL DATA NOTIFICATION message to stop ongong SDT by a certain data size.So the R17 38300CR is modified.*

NOTE 2: In case DL non-SDT data or DL non-SDT signalling ~~or large size of DL SDT data or large size of DL 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. he UE may also be resumed by the Receiving gNB for (e.g., large size of) SDT data or SDT signalling.

///////////////////////////////<Skip unchanged part>///////////////////////////////////////////////

NOTE 4: 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 completes the SDT procedure and directs the UE to continue in RRC\_INACTIVE state by sending the *RRCRelease* message. The UE may also be in RRC\_INACTIVE state by the last serving gNB for (e.g., large size of) SDT data or SDT signalling. ~~In case large size of DL SDT data or large size of DL SDT signalling arrives, the last serving gNB may complete the SDT procedure and direct the UE to continue in RRC\_INACTIVE state by sending the~~ *~~RRCRelease~~* ~~message.~~

R3-234405 (38.401, CT)

NOTE 5: Upon receiving non-SDT, the gNB-CU-UP shall send DL DATA NOTIFICATION message to gNB-CU-CP. The gNB-CU-CP shall terminate the on-going SDT procedure as specified in TS 38.300 [2].

**R18:**

**Proposal 1: When a large size of DL DT data is coming, the gNB-CU-UP shall send DL DATA NOTIFICATION message, adding an explicit indicator to indicate that large size of DL SDT data arrvices.**

**Proposal 2: When a DL non-SDT data is coming, the gNB-CU-UP shall send R17 DL DATA NOTIFICATION message, with legacy IE (i.e., excluding R18 MT-SDT Information IE, not introducing a new IE)**

R3-234088 (38.401, HW)

NOTE 5: Upon receiving non-SDT, the gNB-CU-UP shall send DL DATA NOTIFICATION message to gNB-CU-CP. The gNB-CU-CP may terminate the on-going SDT procedure as specified in TS 38.300 [2].

NOTE x: Upon receiving large size of DL SDT data and if the DL SDT data is above the threshold provided from gNB-CU-CP, the gNB-CU-UP shall send DL DATA NOTIFICATION message with the SDT volume threshold crossed indication. The gNB-CU-CP may terminate the ongoing SDT procedure.

**Proposal 3: NOT add a new codepoint e.g. 'stopSDT' in the existing Bearer Context Status Change IE, to indicate that the ongoing SDT procedure shall be stopped.**

**FFS: How to calculate MT-SDT Data Size for SDT DL data packets.**

**Proposal 4: NOT take SDAP header and PDCP header in DL SDT data volume calculation (CT)**

TP to 37.483

9.3.1.xxx MT-SDT Information

This IE provides the assistant information for MT-SDT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT Data Size | M |  | INTEGER (1..96000,…) | Indicates the total data size for all SDT bearers. Unit: byte. Do not take SDAP header and PDCP header in DL SDT data volume calculation. |

**When DL non-SDT data arrives at last serving gNB during ongoing SDT data transfer and last serving gNB makes the decision for complete UE context relocation to receiving gNB (assuming earlier it did just partial context relocation) and receiving gNB triggers UE transition into RRC\_Connected state by sending RRC Resume message or RRC Release message with an indication. Last sering gNB also sends an indication to the receiving gNB for DL non-SDT data arrival. (QC)**

*Moderator: We have already discussed in R17 MO-SDT, this issue needs RAN2’s LS, so it can be moved to the TEI18 if needed.*

**Proposal 5: Move it to TEI18 if needed.**

**R18 other Stage 2 issue**

R3-234087(HW): TS37.480: This function is used for the gNB-CU-UP to notify the gNB-CU-CP that SDT data crossed the data volume threshold is received during SDT procedure, the gNB-CU-CP can take further action if needed.

R3-234182(Lenovo): TS38.401: add the case that the gNB-CU-CP receives XnAP RAN paging message with MT-SDT information for triggering MT-SDT paging.

In current text of 38.401, only two cases are considered for triggering MT-SDT paging:

- the gNB-CU-CP receives the MT-SDT information in the DL DATA NOTIFICATION message from the gNB-CU-UP.

- the gNB-CU-CP receives DL signalling over NGAP

There is a missing case that the gNB-CU-CP receives XnAP RAN paging message with MT-SDT information.

R3-234352(LG):

Proposal 1: In 38.300 BL CR, the step 6/7 should be merged and refer the MO-SDT procedure from step 2, in order to correctly reflect the agreement to re-use the existing SDT Support Request IE by the receiving gNB in indicating MT-SDT initiation from the UE to the last serving gNB during XnAP Retrieve UE Context Retrieval procedure.

Proposal 2: In 38.300 BL CR, a NOTE should be captured that, if the receiving gNB decided not to trigger MT-SDT paging, the step 3 and afterwards follows the legacy procedure, not SDT procedures.

Proposal 3: In 38.401 BL CR, correct the wording “MT-SDT information” in steps 3 and 4 as “MT-SDT indication”.

R3-234268 (E///) In 38.300BLCR

• Remove the EN on steps 3/4/5

• Addition of the specific ResumeCause indicated by UE in step 4/5

# Conclusion, Recommendations

# References

|  |
| --- |
| 20. NR MT-SDT WIWID [NR\_MT\_SDT-Core]: [RP-213583](https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_94e/Docs/RP-213583.zip) (target: RAN #101) [TU: 0.5 (**0.5**, 0.5)]**QUOTA: 2** |
| 20.1. General*Time plan, skeletons, BLs*  |
| [R3-232533](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232533.zip) | (BLCR to 38.401) Introduction on MT-SDT (Huawei, ZTE, Nokia, Nokia Shanghai Bell, Ericsson, Intel Corporation, China Telecom, Lenovo, LG Electronics) | CR0284r2, TS 38.401 v17.4.0, Rel-18, Cat. B **Endorsed as BL CR** |
| [R3-232534](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232534.zip) | (BLCR to 38.423) Introduciton on MT-SDT (Ericsson, ZTE, Intel Corporation, Nokia, Nokia Shanghai Bell, China Telecom, Huawei, Lenovo) | CR1010r2, TS 38.423 v17.4.0, Rel-18, Cat. B **Endorsed as BL CR** |
| [R3-232535](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232535.zip) | (BLCR to 38.473) Introduction on MT-SDT (Intel Corporation, ZTE, Nokia, Nokia Shanghai Bell, Ericsson, Huawei) | CR1140r2, TS 38.473 v17.4.1, Rel-18, Cat. B* Only capture single author name for BL CR

Rev in [R3-233328](file:///D%3A%5C3GPPmeeting%5C202304%20RAN3%20%23119bis%5Cpre-meeting%5CInbox%5CR3-233328.zip)  **Endorsed as BL CR unseen** |
| [R3-232536](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232536.zip) | (BLCR to 37.483) introduction of MT-SDT (Nokia, Nokia Shanghai Bell, ZTE, Ericsson, Intel Corporation, China Telecom, Huawei, Lenovo, LG Electronics) | CR0054r2, TS 37.483 v17.4.0, Rel-18, Cat. B* Only capture single author name for BL CR

Rev [R3-233329](file:///D%3A%5C3GPPmeeting%5C202304%20RAN3%20%23119bis%5Cpre-meeting%5CInbox%5CR3-233329.zip)  **Endorsed as BL CR unseen** |
| [R3-232561](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232561.zip) | (BLCR to 38 300) Introduction on MT-SDT (ZTE, CATT, Ericsson, China Mobile, China Telecom, Nokia, Nokia Shanghai Bell, Lenovo, Huawei, Google, LG Electronics) | draftCR **Endorsed as BL CR** |
| [R3-233074](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233074.zip) | (BLCR to 38.420) Introduction on MT-SDT (Lenovo, CATT, ZTE) | CR0034r1, TS 38.420 v17.2.0, Rel-18, Cat. B **Endorsed as BL CR** |
| [R3-232562](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232562.zip) | (BLCR to 38.420) Introduction on MT-SDT (Lenovo) | CR0034r, TS 38.420 v17.2.0, Rel-18, Cat. Bwithdrawn |
| 20.2. Support for Paging-Triggered SDTSpecify the support for paging-triggered SDT (MT-SDT) [RAN2, RAN3]* MT-SDT triggering mechanism for UEs in RRC\_INACTIVE, supporting RA-SDT and CG-SDT as the UL response;
* MT-SDT procedure for initial DL data reception and subsequent UL/DL data transmissions in RRC\_INACTIVE.

*Note: Data transmission in DL within paging message is not in scope of this WI.* *MT-SDT can be triggered by DL SDT user data and/or DL SDT signalling.**Upon reception of DL SDT user data, the gNB-CU-UP may include the assistance information (e.g., Data size) in E1AP DL Data Notification message to gNB-CU-CP.* *When receiving DL SDT data, the anchor gNB may send MT-SDT information IE to the neighbour gNBs within the RNA, via XnAP RAN paging message.* *The gNB that receives MT-SDT information within the RNA takes into account this information received in the XnAP RAN PAGING message from the anchor gNB to decide whether to trigger MT-SDT Uu paging.* *Upon reception of MT-SDT information via XnAP RAN paging message from the anchor gNB-CU, the gNB-CU may send F1 MT-SDT information to the gNB-DU via F1AP Paging message.* *RAN3#119bis-e:**Agree to reusing existing IE (i.e., SDT Support Request) within the XnAP Retrieve Context Request message when the UE resumes for MT-SDT, and there is no RAN3 standard impact.**Include an MT-SDT Information Request IE as optional IE in the E1AP: BEARER CONTEXT SETUP REQUEST/ MODIFICATION message to request the report of MT-SDT Information for bearers configured as SDT bearers.**For the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, RAN3 waits for RAN2 on whether any signaling enhancements are needed.**RAN3 acknowledges the case that DL non-SDT data arrives at the last serving gNB following the MT-SDT paging procedure before receiving UE Context Retrieval Request message. It is FFS whether it is left to gNB implementation, or reusing existing IE(s), or introducing a new IE.* *In XnAP: RAN Paging message includes the MT-SDT Data Size IE. FFS on the MT-SDT indicator IE and the presence of MT-SDT Data Size IE.* *The encoding and the name of MT-SDT information IE in E1AP DL DATA NOTIFICATION message include MT-SDT Data Size IE (Mandatory, INTEGER (1…96000, …). FFS on whether MT-SDT indicator IE is needed.* *The encoding and the name of MT-SDT information IE in F1AP: Paging message include MT-SDT indicator IE (Mandatory). FFS on MT-SDT Data Size IE.**Continue to work on the stage3 details*  |
| [R3-232682](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232682.zip) | Signaling enhancements to enable MT-SDT for RRC\_INACTIVE UEs. (Qualcomm Incorporated) | discussion |
| [R3-232686](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232686.zip) | (TP to 38.423, 38.473, 37.483) Introduction on MT-SDT (ZTE) | other |
| [R3-232687](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232687.zip) | (TP to 38.401,37.480) Introduction on MT-SDT (ZTE) | other |
| [R3-232711](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232711.zip) | (TP for TS 37.483 and TS 38.300) Completion of MT-SDT Open Points (Nokia, Nokia Shanghai Bell, Orange ) | other |
| [R3-232712](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232712.zip) | (TP for TS 38.423 and TS 38.473) Completion of MT-SDT Open Points (Nokia, Nokia Shanghai Bell, Orange ) | other |
| [R3-232800](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232800.zip) | (TP for BL CR to TS 38.423/38.473/37.483) Support of MT-SDT (CATT,CERPI) | other |
| [R3-232865](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232865.zip) | (TPs to TS 38.401, 38.473 BL CRs) Consideration on MT-SDT (Huawei) | other |
| [R3-232866](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232866.zip) | (TPs to TS 38.423, 37.463 BL CRs) Consideration on MT-SDT (Huawei) | other |
| [R3-233049](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233049.zip) | (TP to TS 38.300/401/420 BL CRs) Support for Paging-Triggered SDT (Lenovo) | other |
| [R3-233059](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233059.zip) | Discussion on MT-SDT Open issues for E1, F1 and Xn with TPs (Ericsson) | other |
| [R3-233060](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233060.zip) | TPs to TS 38.401 BL CR and E1AP BL CR (Ericsson) | other |
| [R3-233079](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233079.zip) | (TP to TS 38.423, 38.473 and 37.483) Support of MT-SDT (LG Electronics) | other |
| [R3-233080](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233080.zip) | (TP to TS 38.401) MT-SDT Support (LG Electronics) | other |
| [R3-233294](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233294.zip) | Discussion on Support of MT-SDT in Split Architecture (China Telecom) | discussion |
| [R3-233295](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-233295.zip) | Discussion on Remaining Issues for RAN Paging (China Telecom) | discussion |
| [R3-232801](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_120%5CDocs%5CR3-232801.zip) | (TP for BLCR to TS 38.413) Support of Redcap and MT-SDT (CATT,CERPI) | other |
| 1、Left to gNB implementation to handle DL non-SDT data when it arrives at the last serving gNB following the MT-SDT paging procedure before receiving the UE Context Retrieval Request.Lenovo：The gNB behavior is different with R17, change in stage2 is neededNok: Add note in TS38.300QC: Would like to discuss the solutionZTE: Stage2 text is enough**Work on stage2 text on how to handling DL non-SDT data when it arrives at the last serving gNB following the MT-SDT paging procedure before receiving the UE Context Retrieval Request?****CU makes the MT-SDT decision or both?****Discuss the IE presence over interfaces****CB: # 15\_SDT****- Discuss the open issues above and take all the contributions into account****- Capture agreements and open issues**(moderator - ZTE)Summary of offline disc [R3-233330](file:///D%3A%5C3GPPmeeting%5C202304%20RAN3%20%23119bis%5Cpre-meeting%5CInbox%5CR3-233330.zip) |