**3GPP TSG-RAN WG3 #121 R3-234534**

**21st – 25th Aug 2023**

**Toulouse, France**

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](file:///D:\3GPPmeeting\202308%20RAN3%20121\During%20%20meeting\Inbox\R3-234534.zip)

# For the Chairman’s Notes

**Agreement:**

Proposal 1: If the amount of the received DL SDT data is above the threshold provided by 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 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). The behavoir shall be clarfied in R17 stage 2 sepcification.

Proposal 3: Agree to add “Corresponding to the SDAP SDU size of the received DL data” in Semantics Description of 9.3.1.xxx MT-SDT Information.

Proposal 4: Agree to draft the LS to RAN2, with WID code as TEI18, to ask RAN2 for evaluation and check the feasibility.

**Agreed TP:**

R3-234583 - Agreed

R3-234584 - Agreed

R3-234585 - Agreed

R3-234586 - Agreed

R3-234587 - Agreed

R3-234588 - Agreed

**Agreed LS out:**

R3-234589 - Agreed

**From RAN3’s point of view, this WID is closed**

# Discussion- Second round

## Background

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

Proposal 1: If the amount of the received DL SDT data is above the threshold provided by 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 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). The behavoir shall be clarfied in R17 stage 2 sepcification.

Proposal 3: Agree to add “Corresponding to the SDAP SDU size of the received DL data” in Semantics Description of 9.3.1.xxx MT-SDT Information.

Proposal 4: QC drafts the LS to RAN2, with WID code as TEI18, to ask RAN2 for evaluation and check the feasibility.

## Discussion

After offline discussion, we still have some stage 2 issues to be discussed by email.

**TP to 37.480**

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

Proposal 1: If the amount of the received DL SDT data is above the threshold provided by 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.

**Question 1: Based on the above agreement, do you agree with TP to 37.480 (Nokia) to capture the following change.**

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.

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| **Company** | **Yes/No** | **Comment** |
| ZTE | Yes |  |
| Ericsson | Yes | Some reformulation is needed:  This function is used for the gNB-CU-UP to notify the gNB-CU-CP during the SDT procedure that the received DL SDT data crossed the data volume threshold. The gNB-CU-CP can take further action if needed. |
| Nokia | Yes |  |
| Samsung | Yes |  |
| Huawei | yes | Fine for the updates from E/// as well. |
| LGE | Yes | Thank you Yazid. The updated wording has been reflected and uploaded, and fixed the TP to be based on BL CR. |
| CATT | Yes | Also fine with the update from E///. |

**TP to 38.401**

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| R3-234182 (Lenovo)  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.   1. In TS 38.401, add the case that the gNB-CU-CP receives XnAP RAN paging message with MT-SDT information for triggering MT-SDT paging. |

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| R3-234352 (LGE)  **Observation 2: In 38.401 BL CR, it is currently described as if the same MT-SDT information from CU-UP is forwarded to DU (via CU-CP), but according to our stage-3 progresses, E1 MT-SDT info is only about data size, whereas F1 MT-SDT info is just an indicator.**  To avoid confusions and correctly reflect stage-3, the wording “MT-SDT information” in steps 3 and 4 should be clarified as just an “indicator”.  **Proposal 3: In 38.401 BL CR, correct the wording “MT-SDT information” in steps 3 and 4 as “MT-SDT indication”.** |

**Question 2: Do you agree with either P1 (R3-234182) or P3 (R3-234352) or both, If needed, capture into 38.401(ZTE)?**

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| **Company** | **P1 (R3-234182)**  **P3 (R3-234352)** | **Comment** |
| ZTE | Neutral for P1  Agree with P3 |  |
| Ericsson | Agree with P3 |  |
| Nokia | P1 NOK  P2 OK | No Xn in 38401. |
| Samsung | Agree with P3 |  |
| Huawei | Ok for both. |  |
| LG | P3 OK | For P1, agree with Nokia |
| CATT | P1 NOK  P3 OK | For P1, Xn and 38.300 is enough |

**TP to 38.300**

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| R3-234352 (LGE)  **Observation 1: In 38.300 BL CR, between step 2 and step 3, RAN3 agreed that it is possible that a neighborikng gNB who receives XnAP RAN Paging including MT-SDT information may decide to trigger legacy paging instead.**  **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.** |

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| [R3-234268](file:///C:\3GPP-Docs\RAN3-Docs\2023\R3-234268---TP-to-300-BL-CR.docx) (E///)   * P3: Remove the EN on steps 3/4/5 * P4: Addition of the specific ResumeCause indicated by UE in step 4/5 |

**Question 3: Do you agree with either P1/P2 (R3-234352) or P3/P4 (R3-234268) or both. If needed, capture into 38.300 TP (LGE)?**

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| **Company** | **P1 (R3-234352)**  **P2 (R3-234352)**  **P3 (R3-234268)**  **P4 (R3-234268)** | **Comment** |
| ZTE | Yes for all |  |
| Ericsson | Yes for all |  |
| Nokia | OK all |  |
| Samsung | Yes for all |  |
| Huawei | Yes for all but with comments | For 4352, seems we also need to update the figure and remove the step 6, and update the step 7 to day refer to Figure 18.2-1/-2 from step 2?  For 4268, can we change “with a specific ResumeCause for MT-SDT” to “with a MT-SDT resume cause”? |
| LG | Yes for all |  |
| CATT | Yes for all |  |

**Checking the following TPs (based on our agreement)**

**TP to 38.401 (HW) to capture the following.**

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

Proposal 1: If the amount of the received DL SDT data is above the threshold provided by 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 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). The behavoir shall be clarfied in R17 stage 2 sepcification.

**TP to 37.483 (CATT) to capture the following**

Proposal 3: Agree to add “Corresponding to the SDAP SDU size of the received DL data” in Semantics Description of 9.3.1.xxx MT-SDT Information

**TP to 37.483 (E///) to capture the following**

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

Proposal 1: If the amount of the received DL SDT data is above the threshold provided by 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 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). The behavoir shall be clarfied in R17 stage 2 sepcification.

**Draft LS (QC)**

Proposal 4: QC drafts the LS to RAN2, with WID code as TEI18, to ask RAN2 for evaluation and check the feasibility.

# 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:**

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

*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 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. The UE may also be resumed by the Receiving gNB for (e.g., large size of) SDT data or SDT signalling.

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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 continue in RRC\_INACTIVE state by the last serving gNB for (e.g., large size of) SDT data or SDT signalling.

R3-234405 (38.401, CT)

Upon receiving non-SDT data, 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: If the amount of the received DL SDT data is above the threshold provided by 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 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). The behavoir shall be clarfied in R17 stage 2 sepcification.**

1. **No new IE for non-SDT： 8 Nokia, LG , E///, CATT, CT, ZTE, QC, Google,**

**2） New IE for non-SDT ： 2 Lenovo, HW,**

R3-234088 (38.401, HW)

Upon receiving non-SDT data, 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].

If the amount of the received DL SDT data is above the threshold provided by 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.

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

Proposal 3: Agree to add “Corresponding to the SDAP SDU size of the received DL data” in Semantics Description of 9.3.1.xxx MT-SDT Information

TP to 37.483

9.3.1.xxx MT-SDT Information

This IE provides the assistant information for MT-SDT.

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| --- | --- | --- | --- | --- |
| **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. Corresponding to the SDAP SDU size of the received DL data. |

**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.* **R3-221472 => R3-223019**

**R3-221472**

* Option 1: Use RAN paging to trigger the following-up RRC resume procedure after UE is moved to Inactive state.
* Option 2: Add specific cause value or Indication in *RRCRelease* message to indicate UE to trigger the follow-up resume procedure.

**R3-223019**

* RAN2 thanks RAN3 for the LS on handling of DL non-SDT during SDT procedure. If DL non-SDT data/signalling arrive during SDT without anchor relocation, RAN2 confirms that anchor gNB could move the UE back to RRC Inactive by using *RRCRelease* message. Then, the UE re-initiates a new RRC Resume procedure (and the network can move the UE to RRC\_CONNECTED) for follow-up data transmission.
* On how to trigger UE to re-initiate another RRC Resume procedure, RAN2 discussed the two options mentioned in the RAN3 LS in R2-2202144 and has reached the following agreement:

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| As a baseline, for handling the DL non-SDT data/signalling arrival during SDT procedure without anchor relocation: network uses RAN paging to trigger the following-up RRC resume procedure after UE is moved to Inactive state. |

**Proposal 4: QC drafts the LS to RAN2, with WID code as TEI18, to ask RAN2 for evaluation and check the feasibility.**

**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