3GPP TSG-RAN WG3 #119 R3-230834

27th Feb – 3rd Mar 2023

Athens, Greece

Agenda Item: 20.2

Source: ZTE (moderator)

Title: Summary of Offline Discussion on CB: # 9\_R18SDT

Document for: Approval

# Introduction

**CB: # 9\_R18SDT**

**- Discuss on the open issues listed above, at least the first issue**

**- Capture agreements and open issues**

(ZTE - moderator)

Summary of offline disc [R3-230834](file:///D:\3GPPmeeting\202205%20RAN3%20116e\CB\Inbox\R3-230834.zip)

# For the Chairman’s Notes

<TBD>

# Discussion- Second round

<TBD>

# Discussion-First round

## Background

The following is copied from Chair note.

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| 1. Xn RAN paging enhancements:   MT-SDT indication, assistance information  Which node decides MT-SDT?  Opt1: Only the anchor node decides MT-SDT:  MT-SDT indicator is included in Xn RAN paging message sent by the anchor gNB. The encoding and the name of MT-SDT indicator needs to be further discussed.  Opt2: The anchor node triggers the MT-SDT, while the receiving node makes the final decision based on information sent by anchor gNB:  MT-SDT indicator and SDT assistance information (e.g., data size) to be transferred to the receiving gNB.   1. MT-SDT with/without UE context relocation   MT-SDT indication   1. F1 and E1 impact   Data arrival notification over E1  F1 Paging enhancements |

The following is RAN2’s agreement.

**RAN2 #120 meeting**

**Agreements**

1. For RAN paging, MT-SDT indication (at least one bit) is explicitly included per UE via a paging message. FFS if more information for MT-SDT are needed FFS what the indication will be called. FFS signalling details
2. Rel-18 MT-SDT after the MT-SDT paging trigger is detected, RA-SDT and CG SDT solutions/procedures specified in Rel-17 is re-used as a baseline. The detailed triggers will be discussed on case by case. FFS on resources used for access
3. UE can use non-SDT random access resources for accessing the network for an MT-SDT transfer. The UE can also use the configured grant resources and/or MO-RA resources.
4. The network should be able to differentiate why the UL access was triggered, i.e. implicit or explicit indication by the UE.
5. MT-SDT is data that belongs to bearers that are configured for SDT. FFS whether the configuration is MO-SDT or MT-SDT specific. The network can only trigger MT-SDT if the data belongs to those bearers.
6. It is possible for the network to configure only MT-SDT without MO-SDT RA resources and/or CG-SDT. Subsequent UL/DL data belonging to SDT bearers while in INACTIVE is allowed like MO-SDT procedure. FFS stage 3 details
7. New Resume cause in RRC resume will be introduced, one code point MT-SDT indication

**RAN2 #121 meeting**

**Agreement:**

1. Include a one-bit indication in paging to trigger MT-SDT. We will ensure that the CCCH message can be transmitted over CG.
2. Indication is per UE. FFS on signalling.
3. In case condition for paging triggered MT-SDT is not fulfilled the UE initiates RRC Resume procedure. Resume cause FFS
4. Upon receiving MT-SDT trigger, the UE shall initiate SDT procedure if the following checks are satisfied (all these same as Rel-17)

- FFS 3a: Check for DVT (if UL data becomes available in UL)

- 3b: Check for SDT RSRP threshold

- 3c: Check for TA validation before selecting CG (if applicable)

- 3d: Check for SSB level RSRP threshold for CG resource (if applicable)

5. When UE resumes for MT-SDT, UE resumes all RBs configured for SDT

6. RBs configured for SDT are common for MO-SDT and MT-SDT

7. If there is valid CG-SDT resources, the UE should use CG-SDT to transmit the response. FFS on whether we need to optimize for case when CG periodicity is too long

8. To confirm that when SDT is initiated due to MT-SDT, UE can exchange subsequent DL/UL SDT data on the resumed RBs. This clarifies the RB behaviour of related RAN2#120 agreement.

## Which node decides MT-SDT?

Before the selection on the first issue listed in the Chair note, we shall first consider some related issues.

RAN2 has agreed that *Rel-18 MT-SDT after the MT-SDT paging trigger is detected, RA-SDT and CG SDT solutions/procedures specified in Rel-17 is re-used as a baseline. The detailed triggers will be discussed on case by case. FFS on resources used for access*.

**Proposal 1: RAN3 agrees to take MO-SDT procedure in R17 as baseline to support MT-SDT.**

In Rel-17 MO-SDT, both UL user data and UL NAS signalling (i.e., SRB2) are supported for MO-SDT. For the same reason, MT-SDT includes DL user data transmission and DL NAS signalling transmission.

**Proposal 2: MT-SDT includes both DL user data transmission and DL NAS signalling transmission.**

According to the WID, it is to use RAN paging procedure to trigger MT-SDT in the RAN area. In this RAN area, only the anchor gNB (i.e, last serving gNB) stores the UE context, e.g., MT-SDT bearer information (SDT bearer Identity).

**Proposal 3: Only the anchor gNB has acknowledged of MT-SDT bearer information, other than receiving gNBs (i.e., other gNBs within the RAN area).**

Up receipt of DL data/DL NAS signalling from UPF/AMF, since only anchor gNB is aware of the MT-SDT bearer information, the anchor gNB can decide whether the receiving DL data/DL NAS signalling transmission is allowed /expected to use MT-SDT.

**Proposal 4: If deciding to trigger MT-SDT paging, the anchor gNB shall sends MT-SDT indication (The encoding and the name of MT-SDT indicator needs to be further discussed) to the receiving gNBs via XnAP: RAN paging message.**

**Question 1: Do companies agree to P1, P2, P3, and P4?**

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| --- | --- | --- |
| **Company** | **Yes/No**  **P1,P2,P3,P4** | **Comment** |
| ZTE | Yes | For both opt1 and opt2, anchor node shall send MT-SDT indication to receiving node via XnAP: RAN paging message |
| Huawei | Yes | For P2, subsequent UL data or NAS signalling should be also allowed during MT-SDT session. |
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For NR MO-SDT, sdt-DataVolumeThreshold IE is per cell specific parameter which is broadcast via SIB1, and the UE decides whether to initiate MO-SDT only if amount of UL data is above such threshold. The similar principle assumes to be applied to MT-SDT. For MT-SDT, the MT-SDT data volume threshold is configured by each of cell of other gNBs. It is useful for the anchor gNB to transmit the DL data size based its receiving DL data as well as the MT-SDT indication to other gNBs. Up reception of the MT-SDT indication, then the other gNBs within the RAN paging area can judges whether MT-SDT is allowed based on the comparison between DL data size and MT-SDT volume threshold.

**Proposal 5: If deciding to trigger MT-SDT paging, the anchor gNB may send MT-SDT assistant information (e.g., Date size for SDT DRB, detail is FFS) to the receiving gNBs via XnAP: RAN paging message.**

Similar to MO-SDT, for MT-SDT, different cell/gNB within the same RNA area may have different sdt-DataVolumeThreshold, so that different receiving gNB is allowed to trigger either MT-SDT paging or normal paging based on its different sdt-DataVolumeThreshold.

**Proposal 6: Upon reception of MT-SDT indicator and (optional) MT-SDT assistant information, the receiving gNB decides to trigger either normal Uu paging or MT-SDT Uu paging.**

**Question 2: Do companies agree to P5 and P6?**

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| --- | --- | --- |
| **Company** | **Yes/No**  **P5,P6** | **Comment** |
| ZTE | Yes for both | The P5 and P6 are needed for opt 2, but they are not needed for opt1.  For MT-SDT SRB, the MT-SDT assistant information is not needed, and only MT-SDT indicator is enough. |
| Huawei | ‘Yes BUT’ for P5  ‘Yes’ for P6 | For P5, we think the data size of SDT SRB should be also considered in assistance information. |
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There are two options on the table.

* Opt1: Only the anchor node decides MT-SDT:

MT-SDT indicator is included in Xn RAN paging message sent by the anchor gNB. The encoding and the name of MT-SDT indicator needs to be further discussed.

* Opt2: The anchor node triggers the MT-SDT, while the receiving node makes the final decision based on information sent by anchor gNB:

MT-SDT indicator and SDT assistance information (e.g., data size) to be transferred to the receiving gNB.

**Moderator’s view:** Opt1 is that the receiving node **must** follow anchor node’s decision. It means that all receiving node shall trigger the same MT-SDT/normal Uu paging based on the anchor node’s decision.For the opt1, the MT-SDT assistant information is not needed.

**Proposal 7.1: In case of opt 1 (i.e. only the anchor node decides MT-SDT), if deciding to trigger MT-SDT paging, the anchor gNB shall sends MT-SDT indication and do not send MT-SDT assistant indication to the receiving gNBs via XnAP: RAN paging message.**

**Moderator’s view:** Opt2 is that the receiving node can make the final decision. It means different receiving node can make different decision.

**Proposal 7.2: In case of opt 2 (i.e. The anchor node triggers the MT-SDT, while the receiving node makes the final decision based on information sent by anchor gNB), if deciding to trigger MT-SDT paging, the anchor gNB shall sends MT-SDT indication and (optional)MT-SDT assistant indication to the receiving gNBs via XnAP: RAN paging message.**

**Question 3: Do companies prefer opt1 or opt2 and corresponding P7.1/P7.2?**

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| **Company** | **Opt1 or Opt2**  **P7.1, P7.2** | **Comment** |
| ZTE | Opt 2 and P7.2 | We prefer Opt2, But, for opt1, P7.1 is fine. |
| Huawei | Opt 2 and P7.2 | It should be the reciving gNB to decide the data volume threshold to be used to transmit SDT data over radio for both MO-SDT and MT-SDT. Note that we do not need to specify the data volume threshold for MT-SDT, but it is it the receiving gNB’s implementation and should not be determined by the anchor. |
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## Other open issues

Whenever MT-SDT is received by CU UP, the CU UP needs to inform the CU CP over E1AP that data arrived. The E1AP data notification is used. The E1AP DL data notification indicates the QFIs of arriving packets.

**Proposal 8: Up reception of MT-SDT DRB user data, the gNB-UP shall send MT-SDT assistant information (e.g., Date size) to gNB-CP via E1AP DL Data Notification message. FFS on MT-SDT indicator.**

RAN2 has agreed that *For RAN paging, MT-SDT indication (at least one bit) is explicitly included per UE via a paging message. FFS if more information for MT-SDT are needed FFS what the indication will be called. FFS signalling details*.

Based on above, the gNB-CU provides MT-SDT paging information to enable the gNB-DU to trigger MT-SDT Uu paging.

**Proposal 9: If triggering MT-SDT Uu paging, the gNB-CU shall send MT-SDT indicator to gNB-DU via F1AP Paging message. Other assistant information is pending to RAN2.**

**Question 4: Do companies agree to P8 and P9?**

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| **Company** | **Yes/No**  **P8, P9** | **Comment** |
| ZTE | Yes for all |  |
| Huawei | Yes for both | For P8, we think the data volume should be provided in per UE granularity instead of per SDT DRB.  For P9, we think the data volume should also be provided from the CU to the DU, as the data volume threshold should be DU’s implementation. |
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**Question 5: If companies think other essential isuses are needed, please input here.**

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| **Company** | **Yes/No** | **Comment** |
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# Conclusion, Recommendations [if needed]

# References

1. [R3-230111](D:\\会议硬盘\\TSGR3_119\\Docs\\R3-230111.zip) Stage 2 issues on MT-SDT (ZTE) other
2. [R3-230112](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230112.zip) Stage 3 issues on MT-SDT (ZTE) other
3. [R3-230082](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230082.zip) Signaling enhancements to enable MT-SDT for RRC\_INACTIVE UEs (Qualcomm Incorporated) discussion
4. [R3-230104](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230104.zip) (TPs to TS 38.300, 38.473, 37.483 BLCRs) Consideration on MT-SDT (Huawei) other
5. [R3-230105](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230105.zip) Introduction of MT-SDT (Huawei) CR0272r, TS 38.401 v17.3.0, Rel-18, Cat. B
6. [R3-230150](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230150.zip) (Draft CR for TS 38.300) Support of MT-SDT (CATT) draftCR
7. [R3-230151](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230151.zip) Support of MT-SDT in XnAP (CATT) CR0968r, TS 38.423 v17.3.0, Rel-18, Cat. B
8. [R3-230191](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230191.zip) Discussion on MT-SDT (Xiaomi) discussion
9. [R3-230222](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230222.zip) (TP for TS 38.473, TS 38.423) Support of Paging Triggered NR MT-SDT (Nokia, Nokia Shanghai Bell) other
10. [R3-230223](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230223.zip) Introduction of NR MT-SDT (Nokia, Nokia Shanghai Bell, Orange) CR0048r, TS 37.483 v17.3.0, Rel-18, Cat. B
11. [R3-230348](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230348.zip) Support for Paging-Triggered SDT (Lenovo) discussion
12. [R3-230538](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230538.zip) Discussion on RAN3 impacts to support Paging-Triggered SDT and other aspects (Ericsson) discussion
13. [R3-230539](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230539.zip) Support of MT-SDT (Ericsson) CR0986r, TS 38.423 v17.3.0, Rel-18, Cat. B
14. [R3-230562](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230562.zip) Discussion on Support of MT-SDT (China Telecommunications) discussion
15. [R3-230563](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230563.zip) Text proposal on Support of MT-SDT in E1AP (China Telecommunications) discussion
16. [R3-230676](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230676.zip) (TP to TS 38.423, 38.473, 37.483 and 37.480) Support of MT-SDT (LG Electronics) other
17. [R3-230677](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230677.zip) (TP to TS 38.300 and 38.401) MT-SDT Support (LG Electronics) other
18. [R3-230701](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230701.zip)Discussions on MT-SDT impacts on RAN3 (including TP for TS 38.473) (Intel Corporation) discussion
19. [R3-230702](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230702.zip) Baseline CR for introducing Rel-18 NR MT SDT enhancement (Intel Corporation) CR0997r, TS 38.423 v17.3.0, Rel-18, Cat. B
20. [R3-230727](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230727.zip) Discussion on MT-SDT (Samsung) discussion
21. [R3-230728](file:///D:\会议硬盘\TSGR3_119\Docs\R3-230728.zip) MT-SDT related IE in the XnAP RAN PAGING message (Samsung) CR1004r, TS 38.423 v17.3.0, Rel-18, Cat. B