3GPP TSG-RAN WG3 #119bis-e R3-231895

17th – 26th April 2023

Online

Agenda Item: 20.2

Source: ZTE (moderator)

Title: Summary of Offline Discussion on CB: SDT\_MTSDT

Document for: Approval

# Introduction

**CB: # SDT\_MTSDT**

**- Continue to discuss the open issues from last meeting**

**- The issue on DL Non-SDT data arrival during MT-SDT procedure?**

**- Stage2/stage3 TPs if agreeable and check details, split work**

**- Capture agreements and open issues**

(moderator - ZTE)

Summary of offline disc [R3-231895](file:///D:\3GPPmeeting\202304%20RAN3%20%23119bis\Inbox\R3-231895.zip)

Please provide your views by **08:00 UTC Monday April 24.**

Please provide your views by **13:00 UTC Thursday April 20,** so that we can make the 2nd round email discussion before the online session.

# For the Chairman’s Notes

**Proposals for the first round**

BLCR Title: **(BLCR to 38/37.xxx) Introduction on MT-SDT**

**Agree to reuse existing IE (i.e., SDT Support Request) within the XnAP Retrieve Context Request message, to carrier MT-SDT resume indication, then enhancement is not needed.**

**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 the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, RAN3 waits RAN2 to enhance signalling.**

**RAN3 acknowledges the issue on 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, or introduce a new IE.**

**Capture the TP to 38420 including the 2nd change.**

**WA: The encoding and the name of MT-SDT information IE in XnAP: RAN Paging message is as below** (Moderator: Can we change the WA to agreement during online discussion?)

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | M |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

**The encoding and the name of MT-SDT information IE in F1AP: Paging message is as below. FFS: MT-SDT Data Size is mandatory. (**Moderator: Can we change the FFS to WA during online discussion?**)**

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | M |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

**The encoding and the name of MT-SDT information IE in E1AP DL DATA NOTIFICATION message is as below. FFS: MT-SDT indicator is needed.** (Moderator: Can we change the FFS to WA during online discussion?)

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | M |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

**Proposals for the second round**

**Check and capture the TPs to 38.300, 38.401, 38.423, 38.473, 37.483, 38.420.**

TP to 38.423- Nokia

TP to 38.473- E///

TP to 37.483- ZTE

TP to 38.300 -CATT

TP to 38.401- HW

TP to 38.420- Lenovo

# Discussion- Second round

In general, from moderator’s point of view, upon receipt of MT-SDT information from the sending node, the receiving node can further decide whether to trigger MT-SDT procedure by its implementation.

In general, from moderator’s point of view, if not receiving MT-SDT information from the sending node, the receiving node cannot trigger MT-SDT procedure.

After the first round, moderator makes the following progress

**The encoding and the name of MT-SDT information IE in XnAP: RAN Paging message**

**Moderator’s view:** In XnAP, it seems that when receiving MT-SDT information IE, the receiving node can make its decision. As one company said, even implicit indication makes sense, it is better to have an explicit MT-SDT indicator. P1 seems the clearest solution. So that, moderator kindly request all companies to make a compromise.

**Moderator’s proposal 1:**

**The encoding and the name of MT-SDT information IE in XnAP: RAN Paging message is as below**

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | M |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

**Whether and how to carry MT-SDT resume indication into the XnAP Retrieve Context Request message.**

**Moderator’s view:** RAN2 has agreed not to differentiate either MO-SDT or MT-SDT if SDT is triggered, so that it is not needed to introduce a new IE/new cause.

**Moderator’s proposal 2:**

**Agree to reuse existing IE (i.e., SDT Support Request) within the XnAP Retrieve Context Request message, to carrier MT-SDT resume indication, then enhancement is not needed.**

**F1AP impact**

**Moderator’s proposal 3:**

**The encoding and the name of MT-SDT information IE in F1AP: Paging message is as below**

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size (FFS) | O |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: It is FFS on the need of MT-SDT Data Size

**E1AP impact**

**Moderator’s proposal 4:**

**Include a MT-SDT Information Request IE in the E1AP: BEARER CONTEXT SETUP REQUEST message to request the report of MT-SDT Information.**

#### 9.2.2. 1 BEARER CONTEXT SET UP REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| <Skip unchanged part> | | | | |
| MT-SDT Information Request | O |  | ENUMERATED (true, …) | Indicates to request the report of MT-SDT Information. |

#### 9.2.2.4 BEARER CONTEXT MODIFICATION REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| <Skip unchanged part> | | | | |
| MT-SDT Information Request | O |  | ENUMERATED (true, …) | Indicates to request the report of MT-SDT Information. |

Editor’s note: It is FFS on the need of BEARER CONTEXT MODIFICATION REQUEST message.

**Moderator’s proposal 5:**

**The encoding and the name of MT-SDT information IE in E1AP DL DATA NOTIFICATION message is as below**

9.2.2.13 DL DATA NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the DL data detection to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| Paging Priority Indicator (PPI) | O |  | 9.3.1.55 |  |
| **PDU Session To Notify List** | O |  |  |  |
| **>PDU Session To Notify Item** |  | *1..<maxnoofPDUSessionResource>* |  |  |
| >>PDU Session ID | M |  | 9.3.1.21 |  |
| >>QoS Flow List | M |  | 9.3.1.12 |  |
| MT-SDT Information | O |  | 9.3.1.xxx |  |

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator (FFS) | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | FFS |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: It is FFS on the need of MT-SDT indicator.

Editor’s note: the presence of MT-SDT Data Size is FFS

**Moderator’s proposal 6:**

**For the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, RAN3 waits RAN2 to enhance signalling.**

**Moderator’s proposal 7:**

**RAN3 acknowledges the issue on 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, or introduce a new IE.**

**Moderator’s view:** For TS38.420, at least the second change is useful, because RAN paging shall be enhanced to add a new function for MT-SDT procedure, which is similar to the RRC Transfer and Retrieve UE Context Confirm used in MO-SDT.

**Moderator’s proposal 8:**

**Capture the TP to 38420 including the 2nd change.**

**Question: Which of above proposals is not acceptable for you? Please input you view.**

|  |  |  |
| --- | --- | --- |
| **Company** | **P1, P2, …P8** | **Comment** |
| Huawei | Support all | looks good, many thanks for your efforts! |
| Nokia | Partly ok | The proposals are ok with the following corrections/additions:  1/ for proposal 1: add an editor’s note: the need of MT-SDT Indicator is FFS  Moderator: OK, let me try to compromise as that: both MT-SDT indicator and MT-SDT data size are mandatory.  2/ for IEs for which the need is FFS we are ok to have editor’s note but NOK to have it included i.e. the rule is that because it is FFS it will be added if confirmed.  3/ Similarly, when the presence of an IE is FFS, in addition to editor’s note saying that it is FFS if it is optional/mandatory, the column “presence” shall clearly indicate FFS.  Moderator: OK, I try to modify the tabular according to good suggestion. Please double check if I have really captured you view. |
| CATT | Support all | Thanks for the effort on moderating the discussion and the good summary, CATT is fine with all the proposals. |
| Google | Generally ok | Thanks for moderating this CB. We also have some sympathy on Nokia’s comment on the FFS points but no strong view.  About the TP to 38.401 to be checked, does it mean that HW will merge the content proposed in R3-231396 [7] and R3-231785 [18]?  Huawei: I can do that, please find the updated TP in the TP folder. |
| Ericsson | Partly OK | XnAP: the MT-SDT Data Size IE’s presence must be mandatory, otherwise there will be IOT issues.  Moderator: OK, let me try to compromise as that: both MT-SDT indicator and MT-SDT data size are mandatory.  E1AP, what is the presence of the MT-SDT Information Request? We need to check the procedural text to be aligned with receiver behaviour.  Moderator: The presence of the MT-SDT Information Request is optional, which is present in case that CU-CP find it is the MT-SDT supporting UE. Otherwise, it is useless for CU-UP to sum up the data size of all SDT RB. |
| Xiaomi | NOK for P2  Clarification is needed for P4 (this is related to when to configure MT-SDT) | **P2:**  Here are the relevant RAN2 agreements:  RAN2 120:  *The network should be able to differentiate why the UL access was triggered, i.e. implicit or explicit indication by the UE.*  *New Resume cause in RRC resume will be introduced, one code point MT-SDT indication*  RAN2 121:  *RBs configured for SDT are common for MO-SDT and MT-SDT*  RAN2 only says the RB configured for MO-SDT and MT-SDT are common, this has nothing to do with the purpose of UE access. And RAN2 also have agreement that “*The network should be able to differentiate why the UL access was triggered, i.e. implicit or explicit indication by the UE*” and then RAN2 agree to introduce new cause value.  If the understanding of “RAN2 has agreed not to differentiate either MO-SDT or MT-SDT if SDT is triggered” is correct, may I know why RAN2 introduce this new cause value for MT-SDT based on this understanding?  Moderator: In Uu interface, the UE can use normal RACH resource to trigger MT-SDT, so that the receiving node shall be notified of SDT by an explicit IE via RRCResumeRequest message. But the UE has to use specific RA-SDT or CG-SDT resource to trigger MO-SDT, so that the receiving node can be notified of SDT by SDT specific RACH resource then explicit IE is not needed for MO-SDT.  In Xn interface, based on the RAN2 agreement (), the anchor node does not need to differentiate either MO-SDT or MT-SDT, so that existing SDT information can be reused.  **P4:**  Our understanding is that, the bearer is setup when UE is in RRC\_CONNECTED state, SDT is configured when gNB decides to send UE to RRC\_INACTIVE state, which means, the SDT request over E1 is performed after a bearer setup, so it is the bearer context modification request message that should be used to include the SDT request.  Current statement in P4 indicates the scenario that the SDT is configured during bearer setup or new bearer can be step when gNB decides to send UE to RRC\_INACTIVE state, and this is related to stage2 procedure of when MT-SDT is configured, we don’t think RAN3 have a clear picture of this. If we refer to MO-SDT, the SDT is configured when gNB decides to send UE to RRC\_INACTIVE state, the related configuration is included in bearer modification message, which is not the same as P4.  Moderator: In the first round, we have not discussed the Bearer Modification request message so I marked it FFS. Now, I tend to agree with your suggestion, I will add the Bearer Modification request message. |
| Qualcomm | Partially OK but not for all proposals. | For P1 related to Xn-AP, if MT-SDT data is mandatory then MT-SDT Indication seems redundant, which is option 3 in phase 1 discussion. We are fine with either Option 1 or Option 3.  Moderator: Even though it is redundant in this case, many companies still think the explicit indicator IE is still best method. So that, moderator suggest we go to this compromise way because it is at least no harm to introduce the explicit indicator IE.  P4 related to E1-AP: MT-SDT support indication has to be configured per radio bearer level as CU-CP may configure MT-SDT only for certain DRBs only.  P5: In E1-AP DL data notification, data volume notification is essential because it allows CU-CP to make decision whether to trigger MT-SDT ot not.  Moderator: For P4, I do not think so, because RAN2 has agreed that if one SDT bearer is triggered, then all SDT bearers are triggered, so that, the new MT-SDT support indication shall be for per UE supporting MT-SDT other than per DRB.  Moderator: For P5, what mean of “data volume notification”, does it mean the notification as “existed, ….”? Many companies think the detail value of the data size provides more information for CU-CP to make decision.  P2, P3, P6, P7, P8 : OK |
| LGE | No for P1  Yes for P2~P8 | For P1, we are not sure whether the MT-SDT indicator is needed or not if the MT-SDT data size is mandatory.  Moderator: Please see my response for QC as above  For P2, our view is that there is the need to transfer the RRC resume cause to target gNB via Retrieve UE Context procedure. However, if the majority prefers to agree P2, we can follow the majority’s view. |
| Samsung | Support all | The proposals seem to capture companies view well |
|  |  |  |
|  |  |  |

**We will Check and capture the TPs to 38.300, 38.401, 38.423, 38.473, 37.483, 38.420 in the second round.**

TP to 38.423- Nokia

TP to 38.473- E///

TP to 37.483- ZTE

TP to 38.300 -CATT

TP to 38.401- HW

TP to 38.420- Lenovo

# Discussion-First round

## Background

In the last RAN3 #119 meeting, MT-SDT WID has been discussed and has made much progress.

|  |
| --- |
| **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.** **FFS on MT-SDT indicator.**  **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 encoding and the name of MT-SDT information IE is FFS.**  **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.**  **FFS on F1AP MT-SDT information**  **FFS: whether Data volume should also be provided from the CU to the DU in F1AP PAGING message.**  **FFS: whether and how XnAP RTRV UE CTXT REQ message (that carries MT-SDT resume indication)**  **FFS: whether MT-SDT support indication in E1 Bearer Context procedure should be defined to enable the gNB-CU-UP to include the DL data size in the E1AP DL DATA NOTIFICATION message.**  **FFS: whether receiving gNB-CU or receiving gNB-DU decides MT-SDT Uu paging, if we agree that it is the receiving gNB to make the final decision on triggering MT-SDT Uu paging.**  **FFS: MT-SDT assistance information sent from the anchor in the XnAP: RAN paging message and other alignment with RAN2 progress.** |

Meanwhile, RAN2 #121 meeting also made some agreement.

|  |
| --- |
| 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 signaling.  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. |

|  |
| --- |
| Agreements  1. Specify a RRC procedure for RRCResume for MT-SDT initiation without checking for availability of UL data (i.e. if MT-SDT is initiated first the resume cause will be set to MT-SDT)  2. UE is allowed to initiate either MO-SDT based resume or non-SDT based resume at any point (before imitation RRCResumeRequest for MT-SDT) using separate procedures  3. If MT-SDT procedure is initiated, for RACH during subsequent data transfer (i.e. RACH triggered due to SR), UE uses only the non-SDT RACH resources (i.e. like legacy) |

## XnAP impact

**Issue 1: The encoding and the name of MT-SDT information IE in XnAP: RAN Paging message**

**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 encoding and the name of MT-SDT information IE is FFS.**

**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.**

**FFS: whether receiving gNB-CU or receiving gNB-DU decides MT-SDT Uu paging, if we agree that it is the receiving gNB to make the final decision on triggering MT-SDT Uu paging.**

**FFS: MT-SDT assistance information sent from the anchor in the XnAP: RAN paging message and other alignment with RAN2 progress.**

Many contributions (e.g., [3], [4], [6], [8], [11], [12], [14], [16], [19]) address on this issue.

**Option 1:** [3], [6], [14]

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT indicator | M |  | ENUMERATED (true,…) |  |
| MT-SDT Data Size | O |  | INTEGER (0…65535, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 2:** If MT-SDT indicator exists, it is MT-SDT SRB, if MT-SDT Data Size exists, it is MT-SDT DRB [11], and otherwise, it is the MT-SDT SRB.

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT indicator | O |  | ENUMERATED (true,…) |  |
| MT-SDT Data Size | O |  | INTEGER (0…65535, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 3:** In this case, the MT-SDT indicator is implicitly indicated [12].

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT Data Size | M |  | INTEGER (0…65535, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 4:** In this case, the MT-SDT indicator is implicitly indicated [4]. If MT-SDT Data Size exists, it is the MT-SDT DRB, otherwise, it is the MT-SDT SRB.

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT Data Size | O |  | INTEGER (0…65535, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 5:** MT-SDT Data Size is not needed.

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT indicator | M |  | ENUMERATED (true,…) |  |

Moderator thinks option 2 is not suitable, because RAN2 agreed not to differentiate SDT DRB and SDT SRB.

Moderator thinks option 3 and option 4 are very similar to option 1. But in order to align to MO-SDT indicator (seen as below), we prefer to explicitly introduce the MT-SDT indicator as that in MO-SDT.

/////////////////////////////////TS 38.423//////////////////////////////////////////

#### 9.2.3.163 SDT Support Request

This IE indicates that the UE requested for SDT and may include additional assistance information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| SDT Indicator | M |  | ENUMERATED (true,…) |  |
| SDT assistant information | O |  | ENUMERATED (single packet, multiple packets, …) | “Single packet” indicates no subsequent SDT transmission is expected;  “Multiple packets” indicates subsequent SDT transmission is expected. |

/////////////////////////////////TS 38.423//////////////////////////////////////////

Moderator thinks option 5 is incomplete, because according to our previous agreement, the MT-SDT Data Size is useful for receiving gNB to make good decision on MT-SDT Uu paging triggering.

Moderator thinks option 1 has the following benefit.

1. Aligning with MO-SDT information specified in the current specification.
2. Easy to be extended.
3. For SDT SRB, data size can be not introduced.

Based on the above analysis, moderator provides the following proposal.

**Proposal 1: Agree option 1 as below to be the encoding and the name of MT-SDT information IE.**

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | O |  | INTEGER (FFS) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Question 1: Do companies agree to P1, or do you prefer other option?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | Yes with comments | The presence of MT-SDT Data Size should be mandatory. Otherwise, how to comprehend the case that the IE is absent. |
| Huawei | Yes | Propose to use data size INTEGER (1..96000, …)  And it is better to remove the second sentence In the Editor’s Note.  To Lenovo, in some network, the SDT may only be used for some specific service, with very small data packets, then there seems no need to provide data size at all, therefore we think it is better to keep it as O.  For MO-SDT, the sdt-DataVolumeThreshold-r17 is provided over SIB1, and used by the UE to determine whether the MO-SDT can be initiated, and it is designed as ENUMERATED {byte32, byte100, byte200, byte400, byte600, byte800, byte1000, byte2000, byte4000, byte8000, byte9000, byte10000, byte12000, byte24000, byte48000, byte96000}. Considering that the detailed data size could be provided in case of MT-SDT, similar to the Data Size IE in the S1AP: PAGING message, we can also use INTEGER type to provide the accurate data size, and maybe we can use the max value of the MO-SDT data volume threshold as the maximum size. |
| China Telecom | yes | We can also support Option 1.  With regard to the max value of MT-SDT data size, we share same view as Huawei |
| CATT | Yes | Share the view with HW on the value of the data size, and ok to remove the Editor’s note. |
| Qualcomm | Yes |  |
| Google | Yes | Can support Option 1 and the proposed data size by HW |
| Nokia | No | Option 1 contradicts the agreement taken last meeting that new gNB should take the final decision. Here option 1 allows the anchor gNB to only send MT-SDT indication without the Data Size which is optional, therefore preventing the new gNB to make conscious decision by follow blindly the anchor gNB ‘s choice. Therefore, Data Size should be mandatory, we are not convinced by Huawei explanation: if data size is small, then let us add it.  Then as soon as Data Size is mandatory, the MT-SDT indicator is no longer needed.  We therefore support option 3.  About the range, we also propose Integer like Huawei, we are ok to have range 96000 to be on safe side as proposed by Huawei.  Moderator: Option 1 does not contradicts our previous agreement. If only MT-SDT indicator IE is included, the receiving node can also decide to trigger normal Paging. |
| Ericsson | No | Same view as Nokia, Option 1 with optional Data size IE contradicts the agreement from last meeting that the new gNB makes final decision on triggering MT-SDT Paging. Also, we do not need to align with MO-SDT formatting, as the MO-SDT assistance data is for a different call-flow and comes from a different origin (UE).  We support option 3  Moderator: Option 1 does not contradicts our previous agreement. If only MT-SDT indicator IE is included, the receiving node can also decide to trigger normal Paging. |
| ZTE | Yes | To Nokia, we do not think option 1 contradicts the agreement. Even without Data size, the new gNB can also make final decision based on its implementation. We are fine to define the value of data size proposed by HW. |
| Xiaomi | Yes |  |
| Samsung | Yes | Even implicit indication makes sense, we prefer having explicit MT-SDT indicator. P1 seems the clearest solution. |
| LGE | Yes | Agree with Huawei’s suggestion for the data size |

**Moderator’s summary:**

12 companies provide their view.

10 companies support P1 (i.e., option 1), 2 companies support option 3, 1 companies supports P1 but suggests Data Size IE is also mandatory.

Many companies support the value of Data size is INTEGER (1..96000, …) and no company objects it.

**Moderator’s view:** It seems that when receiving MT-SDT information IE, the receiving node can make its decision. As one company said, even implicit indication makes sense, it is better to have an explicit MT-SDT indicator. P1 seems the clearest solution. So that, moderator kindly request all companies to make a compromise.

**Moderator’s proposal:**

**The encoding and the name of MT-SDT information IE in XnAP: RAN Paging message is as below**

9.2.3.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | O |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: It is FFS whether MT-SDT Data Size is optional.

**Issue 2: Whether and how to carry MT-SDT resume indication into the XnAP Retrieve Context Request message.**

**FFS: whether and how XnAP RTRV UE CTXT REQ message (that carries MT-SDT resume indication)**

Many contributions agree to carrier MT-SDT resume indication into the XnAP Retrieve Context Request message.

**Option 1:** Introduce a new IE (e.g., MT-SDT Support Request) to carrier MT-SDT resume indication.

#### 9.1.1.8 RETRIEVE UE CONTEXT REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.2.3.1 |  |
| <Skip unchanged part> | | | | |
| RRC Resume Cause | O |  | 9.2.3.61 | In case of RNA Update, contains the cause value provided by the UE in the *RRCResumeRequest* or the *RRCResumeRequest1* message, as defined in TS 38.331 [10],  or in the *RRCConnection ResumeRequest* message, as defined in TS 36.331 [14]. |
| SDT Support Request | O |  | 9.2.3.163 |  |
| MT-SDT Support Request | O |  | 9.2.3.yyy |  |

**Option 2:** Introduce a new Cause value to carrier MT-SDT resume indication.

#### 9.1.1.8 RETRIEVE UE CONTEXT REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.2.3.1 |  |
| <Skip unchanged part> | | | | |
| RRC Resume Cause | O |  | 9.2.3.61 | In case of RNA Update and MT-SDT, contains information provided in the *resumeCause* by the UE in the *RRCResumeRequest* or the *RRCResumeRequest1* message, as defined in TS 38.331 [10],  or information provided in the *resumeCause-r15* in the *RRCConnection ResumeRequest* message, as defined in TS 36.331 [14]. |
| SDT Support Request | O |  | 9.2.3.163 |  |

**Option 3:** Reuse current existing IE (i.e., SDT Support Request) to carrier MT-SDT resume indication.

But one contribution thinks it is not needed to carrier MT-SDT resume indication.

Moderator thinks based on RAN2 agreement, RAN3 shall agree that the receiving gNB shall also transfer receiving MT-SDT resume indication to the anchor gNB via XnAP Retrieve Context Request message. More, RAN2 has also agreed not to differentiate either MO-SDT or MT-SDT. RAN3 can reuse the existing IE (i.e., SDT Support Request) to carrier MT-SDT resume indication.

**Proposal 2: Agree to reuse existing IE (i.e., SDT Support Request) within the XnAP Retrieve Context Request message, to carrier MT-SDT resume indication, then enhancement is not needed.**

**Question 2: Do companies agree to P2, or do you prefer other option?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | No | Since whether to perform regular paging or MT-SDT paging is decided by the receiving gNB, the receiving gNB needs to indicate it decision to the last serving gNB so that the last serving gNB can decides whether anchor relocation is needed. For regular paging, anchor relocation is mandatory following Rel-17 procedure but for MT-SDT paging anchor relocation is optional. If RAN2 decides a new RRC Resume cause, it can be reused in Xn-AP interface. Otherwise, a new indication is needed. |
| Huawei | Yes | No need for new MT-SDT indicator or new resume cause. |
| China Telecom | Yes | The existing IE is enough. |
| CATT | Yes | Even if UE resume cause is for MT-SDT, the receiving gNB just need to provide an SDT indicator in the retrieval request, anchor gNB knows what is it for. Thus, the existing procedure could be fully reused without any enhancement. |
| Qualcomm | Yes | RAN2 agreed that based on UE implementation it can either send MO-SDT or MT-SDT resume cause depending on whether UE has evaluated MO-SDT triggering conditions when MT-SDT paging was received. In either case, there is no need for Anchor gNB to differentiate MO vs MT and UE context transfer procedure is same. |
| Google | Yes/No | Option 2 is preferred as RAN2 introduces a resumeCause for MT-SDT. But we can accept option 3 if the majority supports to reuse it. |
| Nokia | Yes | We have not identified at this stage a reason for anchor gNB to differentiate MO-SDT from MT-SDT in the process of deciding whether to relocate the context. |
| Ericsson | Yes | Agree with moderator’s proposition |
| ZTE | Yes |  |
| Xiaomi | No  Yes to option2 | We prefer option2, we think the intention for RAN2 to introduce this new resume cause is that gNB can distinguish whether it’s resumed for MO-SDT or MT-SDT.  We think RAN3 should align with RAN2 agreement and understanding, or we need to send LS to check with RAN2 the intension of the new resume cause. |
| Samsung | Yes |  |
| LGE | No | Same view with Xiaomi and Lenovo |
|  |  |  |

**Moderator’s summary:**

12 companies provide their view.

8 companies support P2 (i.e., option 3), 4 companies support option 1/2 but 1 of their companies can compromise to P2.

**Moderator’s view:** RAN2 has agreed not to differentiate either MO-SDT or MT-SDT if SDT is triggered, so that it is not needed to introduce a new IE/new cause.

**Moderator’s proposal:**

**Agree to reuse existing IE (i.e., SDT Support Request) within the XnAP Retrieve Context Request message, to carrier MT-SDT resume indication, then enhancement is not needed.**

## F1AP impact

**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.**

**FFS on F1AP MT-SDT information**

**FFS: whether Data volume should also be provided from the CU to the DU in F1AP PAGING message.**

**FFS: whether receiving gNB-CU or receiving gNB-DU decides MT-SDT Uu paging, if we agree that it is the receiving gNB to make the final decision on triggering MT-SDT Uu paging.**

**Option 1:** This is the similar to XnAP signaling. When receiving MT-SDT Information from anchor gNB, the receiving gNB can further decide to trigger MT-SDT procedure. In case of split gNB, the gNB-CU sends MT-SDT Indicator and optional MT-SDT Data Size to gNB-DU. Then the gNB-DU can finally decide to encode MT-SDT Uu paging based on its implementation.

9.3.1.XX MT-SDT Information

This IE indicates MT-SDT information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT Indicator | M |  | ENUMERATED (true, ...) |  |
| MT-SDT Data Size | O |  | INTEGER (1..96000, …) | The Unit is: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 2:** This option is similar to option 1, but MT-SDT indicator is implicit then is not included.

9.3.1.XX MT-SDT Information

This IE indicates MT-SDT information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT Data Size | M |  | INTEGER (1..96000, …) | The Unit is: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 3:** In this option, only MT-SDT indicator is needed.

9.3.1.XX MT-SDT Information

This IE indicates MT-SDT information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT Indicator | M |  | ENUMERATED (true, ...) |  |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

Moderator thinks both option 1 and option 2 are similar, but referring to existing F1AP, MO-SDT includes explicit MO-SDT indicator, as below, it is straightforward to explicitly introduce MT-SDT indicator.

/////////////////////////////////TS 38.473//////////////////////////////////////////

#### 9.3.1.262 SDT Information

This IE is used to indicate an SDT transaction and to provide the assistant information from the UE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| SDT Indicator | M |  | ENUMERATED (true,…) |  |
| SDT Assistant Information | O |  | ENUMERATED (single packet, multiple packets, …) | “single packet” indicates no subsequent SDT transmission is expected.  “multiple packets” indicates subsequent SDT transmission is expected. |

/////////////////////////////////TS 38.473//////////////////////////////////////////

Moderator also thinks option 3 is not complete, because it is DU to encode the Uu paging and it is better to provide assistant information to DU to make good decision.

**Proposal 3: Agree option 1(as below) including MT-SDT indicator and optional MT-SDT Data size within F1AP MT-SDT information to the gNB-DU via F1AP Paging message.**

9.3.1.XX MT-SDT Information

This IE indicates MT-SDT information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT Indicator | M |  | ENUMERATED (true, ...) |  |
| MT-SDT Data Size | O |  | INTEGER (FFS) | The Unit is: byte. |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Question 3: Do companies agree to P3, or do you prefer other option?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | Option 3 | For F1-AP, it is straight forward that it is up to gNB-CU to decide whether to perform regular RAN paging or MT-SDT RAN paging. In this case, it is not needed to provide data volume information to the gNB-DU. The gNB-CU only needs to include MT-SDT indication to gNB-DU so that the gNB-DU can include it in RAN paging message to UE. |
| Huawei | Yes | It is needed for the gNB-CU to provide the MT-SDT information to the gNB-DU with the optional data size.  Propose to use data size INTEGER (1..96000, …)  And it is better to remove the second sentence In the Editor’s Note. |
| China Telecom | Option3 | The data volume seems useless for both UE and DU… |
| CATT | Yes | Anyway, gNB-DU is responsible for generating the final Uu Paging message. As one gNB-CU may connect to many gNB-DUs, with different capabilities, it’s beneficial to provide MT-SDT indicator and also the data size to the gNB-DU. This is also well aligned with the Xn design. |
| Qualcomm | Option 1 for signalling but CU-CP makes MT-SDT decision | Even if multiple DUs are connected to same CU-CP, CU-CP can determine whether to trigger MT-SDT or not as it knows UE capabilities, SDT bearers, data volume thresholds to trigger MT-SDT. DU does not have any radio channel condition information for INACTIVE UEs as there is no UL physical transmission in RRC\_INACTIVE state. Argument of DU can make decision based data volume is not sufficient because MT-SDT is not intended for high data rates and is more suitable for small data, which can be infrequent and transmission of same small data without MT-SDT requires transition of UE into RRC\_CONNECTED state, which requires additional signalling overhead and amount of data transmitted is still same without any additional gain from radio resource perspective.  **In out view intention of data volume indication can be useful for DU to make resource reservation of scheduling purpose instead of DU to make decision of MT-SDT paging.** |
| Google | Option 3 | We also think that the gNB-CU makes the decision of the Uu Paging for normal data/signaling or MT-SDT data/signalling |
| Nokia | Option 3 | The key point is which node makes the decision and here we think CU CP has all information to make the decision. Therefore, data size should not be provided so that gNB-DU simply follows the decision of CU CP. |
| Ericsson | Option 1 | The data information is needed in any case for resource scheduling purpose, as raised by QC, and also to align with XnAP RAN Paging message. It seems incomplete if DU is not aware of the data size for the SDT session as the lower layers need such information for reservation of resources. Option 1 with optional Data size seems like a good compromise. |
| ZTE | Yes (i.e., option1) | In our view, we shall allow each node to make its decision by its implementation. We also agree with QC’s analysis. |
| Xiaomi | Option 3 | **This is related to Paging decision, why the DU needs to reserve the resource even through the DU is not sure UE will response to it**? The resource should be allocated after UE’s response to the Paging.  If we refer to UE decision on triggering MO-SDT, the following information is considered:   * *sdt-Config* is configured [both DU and CU knows] * all the pending data is mapped to the radio bearers configured for SDT[serving CU knows] * lower layers indicate that conditions including: * *sdt-DataVolumeThreshold*[both DU and CU knows, as it configured by OAM] * *sdt-RSRP-Threshold*: [may not be needed for MT case, both DU or CU cannot know the RSRP before UE response to paging] * *cg-SDT-RSRP-ThresholdSSB [*may not be needed for MT case, both DU or CU cannot know the RSRP before UE response to paging]   based on the above, we don’t see the need for DU to make the final decision. |
| Samsung | Option 3 | We do not think Data size should be transferred to the DU, as the CU will be aware of the threshold to trigger MT-SDT. |
| LGE | Option 3 | We think that since the gNB-CU has all information (e.g., UE capabilities, DL data size) on whether to trigger the MT-SDT paging, the gNB-CU needs to make the final decision. |
|  |  |  |

**Moderator’s summary:**

12 companies provide their view.

5 companies support P1 (i.e., option 1), 7 companies support option 3

So that, all companies support to introduce MT-SDT Indicator IE, half companies support to introduce MT-SDT data size but another half companies do not support it.

**Moderator’s proposal:**

**The encoding and the name of MT-SDT information IE in F1AP: Paging message is as below**

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size (FFS) | O |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: It is FFS on the need of MT-SDT Data Size

## E1AP impact

**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.** **FFS on MT-SDT indicator.**

**FFS: whether MT-SDT support indication in E1 Bearer Context procedure should be defined to enable the gNB-CU-UP to include the DL data size in the E1AP DL DATA NOTIFICATION message.**

In [19], it suggests to discuss which node (CU-CP v.s. CU-UP) to decide whether to trigger MT-SDT, however, as usually, we shall allow each node to decide MT-SDT configuration by its implementation. In the last meeting, we have agreed that, when gNB-CU-UP receives DL data/DL NAS signaling, it can decide to trigger MT-SDT procedure, by sending MT-SDT information via E1AP DL DATA NOTIFICATION message. Then, gNB-CU-CP can further decide whether to trigger MT-SDT procedure.

/////////////////////////////////BLCR TS 37.483//////////////////////////////////////////

9.2.2.13 DL DATA NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the DL data detection to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| Paging Priority Indicator (PPI) | O |  | 9.3.1.55 |  |
| **PDU Session To Notify List** | O |  |  |  |
| **>PDU Session To Notify Item** |  | *1..<maxnoofPDUSessionResource>* |  |  |
| >>PDU Session ID | M |  | 9.3.1.21 |  |
| >>QoS Flow List | M |  | 9.3.1.12 |  |
| MT-SDT Information | O |  | 9.3.1.xxx |  |

/////////////////////////////////BLCR TS 37.483//////////////////////////////////////////

Both [3] and [7] suggest to introduce the MT-SDT Indicator and optional MT-SDT Data Size within the MT-SDT information, which is similar to XnAP and F1AP.

In [4], [10], [14] and [16], they think MT-SDT Data Size is needed, but MT-SDT indicator is not needed due to implicit method.

In [7], [10] and [16], considering that R17 gNB-CU-UP can only support MO-SDT, it suggests to a new explicit indicator in E1AP Bearer Context procedure to indicate whether MT-SDT is enabled.

**Option 1:** Introduce MT-SDT Indicator and optional MT-SDT Data Size within the MT-SDT information

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 Indicator | M |  |  |  |
| MT-SDT Data Size | O |  | INTEGER (1..96000, …) | The Unit is: byte.  The downlink data size for SDT bearers buffered in CU-UP |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 2:** MT-SDT Data Size is needed, but MT-SDT indicator is not needed

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 | O |  | INTEGER (1..96000, …) | The Unit is: byte.  The downlink data size for SDT bearers buffered in CU-UP |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 3:** A new explicit indicator in E1AP Bearer Context procedure to indicate whether MT-SDT is enabled

#### 9.2.2.4 BEARER CONTEXT SET UP/MODIFICATION REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| <Skip unchanged part> | | | | |
| MT-SDT indication |  |  | ENUMERATED (true, …) | Indication on whether MT-SDT is enabled |

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 Indicator | M |  |  |  |
| MT-SDT Data Size | O |  | INTEGER (1..96000, …) | The Unit is: byte.  The downlink data size for SDT bearers buffered in CU-UP |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Option 4:** A new explicit indicator in E1AP Bearer Context procedure to indicate whether MT-SDT is enabled.

#### 9.2.2.4 BEARER CONTEXT SET UP/MODIFICATION REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| <Skip unchanged part> | | | | |
| MT-SDT indication |  |  | ENUMERATED (true, …) | Indication on whether MT-SDT is enabled |

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, …) | The Unit is: byte.  The downlink data size for SDT bearers buffered in CU-UP |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

Moderator thinks MT-SDT indicator within E1AP Bearer Context request message are not needed, because gNB-CU and gNB-DU have already acknowledged per node’s capability by OAM. Moreover, SDT information (i.e., ResumeforSDT) is already included in the existing E1AP Bearer Context request message as below [1], and RAN2 agreed not to differentiate MO-SDT and MT-SDT, so that, moderator thinks it is not needed to introduce a new IE (e.g., MT-SDT indicator) in the E1AP Bearer Context request message again.

/////////////////////////////////TS 37.483//////////////////////////////////////////

|  |  |  |  |
| --- | --- | --- | --- |
| Bearer Context Status Change | O | ENUMERATED (Suspend, Resume, …, ResumeforSDT) | Indicates the status of the Bearer Context.  *NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP* |

/////////////////////////////////TS 37.483//////////////////////////////////////////

For moderator’s view, option 2 is very similar to option 1. However, moderator suggests to introduce an explicit indictor, which is already used in MO-SDT configuration in XnAP and F1AP.

In [1], it suggests to introduce Data Size and MT-SDT of each DRB, but RAN2 has agreed to configure all SDT DRB and SRB (*RAN2: When UE resumes for MT-SDT, UE resumes all RBs configured for SDT).* So it is suitable to configure MT-SDT Data Size for sum of SDT DRBs and one MT-SDT indicator.

**Proposal 4: Agree option 1(as below) which includes MT-SDT indicator and optional MT-SDT Data size within MT-SDT information via E1AP DL DATA NOTIFICATION message.**

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 Indicator | M |  |  |  |
| MT-SDT Data Size | O |  | INTEGER (**FFS**) | The Unit is: byte.  The downlink data size for SDT bearers buffered in CU-UP |

Editor’s note: MT-SDT Data Size is one kind of MT-SDT assistance information, the value is FFS. MT-SDT Data volume as another kind of MT-SDT assistance information is not included.

**Question 4: Do companies agree to P4, or do you prefer other option?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | Yes with comments | Same with Q1, the MT-SDT Data Size should be mandatory. |
| Huawei | Yes | As clarified in Q1, Data size should be optional.  Propose to use data size INTEGER (1..96000, …)  And it is better to remove the second sentence In the Editor’s Note. |
| China Telecom | No  Prefer Option 4 | 1)MT-SDT indication in Bearer Context request:  We think this information is necessary for MT-SDT. as we know, both Rel-17 and Rel-18 UE may co-exist in real network. Without any assistant information from CU-CP, the CU-UP could not have the knowledge of the radio capability or RRC version of one UE. In addition, Rel-17 MO-SDT and Rel-18 MT-SDT are different features for NG-RAN. As an operator, NG-RAN needs to support to configure either MO-SDT or MT-SDT for a set/group of UEs. Therefore, OAM based solution could not work in principle.  2)MT-SDT information in E1AP DL DATA NOTIFICATION  MT-SDT Indicator is no need…MT-SDT Data Size is enough. |
| CATT | Yes | Fine to keep alignment with Xn and F1, use an indicator and optional data size. |
| Qualcomm | Yes | CU-UP does not need to send this indication for signalling RB, as DL signalling is directly received by CU-CP instead of CU-UP. Data volume can be FFS. EN can be removed. |
| Google | No | Either the MT-SDT indicator or the MT-SDT Data Size is enough; if the ultimate decision is to be made by the CU-CP, Option 2 (MT-SDT Data Size) is preferred. |  |
| Nokia | No (Option 4) | Same view as China Telecom and Google. Based on previous agreement of CU CP making decision, the key point is data size is necessary and should be mandatory. And because data size is there, there is no need of additional MT-SDT Indicator. |
| Ericsson | Yes (Option 2) | Ok to add only the Data Size (M) in the E1AP DL DATA NOTIFICATION message |
| ZTE | Yes | Agree with HW. |
| Xiaomi | Option 2 or 4 | We think only data size is needed, it’s the CU-CP to make decision on whether it’s SDT or non-SDT |
| Samsung | Yes | Agree with HW. Also okay with the Option 2 if it is the majority view. |
| LGE | No (Option 4) | We think that the *MT-SDT Indicator* IE in the *MT-SDT Information* IE is not needed since the gNB-CU-CP can be implicitly aware of whether the DL data buffered in the gNB-CU-UP belongs to bearers configured for the SDT if the *MT-SDT Data Size* IE is included into the E1AP DL Data Notification message. Therefore, the *MT-SDT Data Size* IE should be mandatory.  For the MT-SDT indication IE in the E1AP BEARER CONTEXT SETUP REQUEST message, this can be discussed in Q9. |
|  |  |  |

**Moderator’s summary:**

12 companies provide their view.

All companies agrees to introduce Data Size, it is FFS on either mandatory or optional.

Many companies support the value of Data size is INTEGER (1..96000, …) and no company objects it.

Half of companies support to introduce MT-SDT indicator, but another half of companies do not support. So that, it is FFS on the need of MT-SDT indicator.

More, majority companies prefer to introduce a new explicit indicator in E1AP Bearer Context procedure to indicate whether MT-SDT is enabled, which is discussed and proposed in section 4.6.

**Moderator’s proposal:**

**The encoding and the name of MT-SDT information IE in E1AP DL DATA NOTIFICATION message is as below**

9.2.2.13 DL DATA NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the DL data detection to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| Paging Priority Indicator (PPI) | O |  | 9.3.1.55 |  |
| **PDU Session To Notify List** | O |  |  |  |
| **>PDU Session To Notify Item** |  | *1..<maxnoofPDUSessionResource>* |  |  |
| >>PDU Session ID | M |  | 9.3.1.21 |  |
| >>QoS Flow List | M |  | 9.3.1.12 |  |
| MT-SDT Information | O |  | 9.3.1.xxx |  |

9.3.1.xxx MT-SDT Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** |
| MT-SDT indicator (FFS) | M |  | ENUMERATED (true, …) |  |
| MT-SDT Data Size | O (FFS) |  | INTEGER (1…96000, …) | Indicates the total data size for all SDT bearers. Unit: byte. |

Editor’s note: It is FFS on the need of MT-SDT indicator. It is FFS whether MT-SDT Data Size is optional.

## Stage 2 issue

**Issue 1: DL Non-SDT data arrival during MT-SDT procedure**

In [6], it states this new issue, the detail is as below.

|  |
| --- |
| While the MT-SDT procedure is ongoing, if DL non-SDT data/signalling arrives, the network can straightaway move the UE to RRC\_CONNECTED state by sending the RRCResume message if the UE responds to paging and resumes in the last serving gNB.  However, since both with and without UE context relocation procedures will be supported for MT-SDT, and if the DL non-SDT data arrives in the last serving gNB while it is anchoring the MT-SDT procedure, it will not be able to move the UE to RRC\_CONNECTED state straight away by sending RRCResume message. Instead, the gNB will have to send RRCRelease message to the UE to terminate the ongoing MT-SDT procedure and then again perform paging in the RNA. When the UE responds to Paging, the UE’s context will be relocated and the UE will be moved to RRC\_CONNECTED state and only then the new serving gNB will be able to send the DL non-SDT data to the UE. Such procedure will clearly lead to unnecessary signaling overhead and latency in sending, time critical, DL data.  To avoid this, it would be worth allowing the last serving gNB to include an indication in the RRCRelease message informing the UE it should initiate a new resume procedure right-away.  When the UE initiates a new legacy resume procedure, the UE context can be relocated form the last serving gNB to the receiving gNB and the UE can be transitioned to the RRC\_CONNECTED state by reusing the legacy procedure. Hence, we propose the following.  **Proposal 4: When DL non-SDT data arrives during the ongoing MT-SDT procedure, the last serving gNB shall end the ongoing SDT procedure by sending *RRCRelease* message to the UE with an indication to initiate a new Resume procedure to avoid paging there by reducing the signaling overhead and latency for time critical DL non-SDT data transfer.** |

Moderator’s view, this is issue has already been discussed in Rel-17 MO-SDT, but RAN2 does not agree to introduce a new IE in the RRCRelease message.

/////////////// R3-223019//////////////////

**1. Overall Description:**

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:

|  |
| --- |
| 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. |

/////////////// R3-223019//////////////////

Then, RAN3 in #116e meeting made the following agreement.

**According to the reply LS [R3-223019], it is agreed not to enhance stage 3 specs.**

**Question 5: For the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, which option do companies prefer?**

**Option 1: It is the same as DL non-SDT data arrives during ongoing MO-SDT procedure. So, no enhancement is needed.**

**Option 2: The last serving gNB shall end the ongoing SDT procedure by sending RRCRelease message to the UE with an indication to initiate a new Resume procedure to avoid paging there by reducing the signalling overhead and latency for time critical DL non-SDT data transfer.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1**  **Vs**  **Option 2** | **Comment** |
| Lenovo | Option 2 | We see some benefits of option2 to reduce the legacy. Otherwise, the last serving gNB have to buffer the data for a large time taking MT-SDT paging into account. |
| Huawei | Option 2 | Option 2 is clearly much more efficient than option 1. |
| China telecom | Option 1 |  |
| CATT | Prefer Option 1; Option 2 should be discussed and decided by RAN2. | As the rapporteur said, we have a lot of discussion in RAN3 and RAN2 during R17 MO-SDT, and finally decided not to make the enhancement.  Whether to go for the option 2 is up to RAN2. |
| Qualcomm | See comments | Option 2 is one possible candidate.  Other possible variants to consider are  **Option 3:** Upon receiving non-SDT data, anchor gNB can make decision to transfer full UE context to serving gNB (assuming partial UE context transfer earlier) and including non-SDT data arrival indication. Receiving GNB can send RRC Resume Request message to transition UE directly into RRC\_CONNECTED state.  **Option 4:** Anchor node to send full UE context transfer to receive gNB and include non-SDT data arrival indication. Then receiving GNB can send RRC Release message including CFRA resources or indication to trigger UE to resume RRC Connection using CFRA Resources.  Discuss above options in addition to Option 2. |
| Google | Option 1 | For Option 2, isn’t it a RAN2 based solution to add an indication in the RRCRelease message and should be discussed there? |
| Nokia | Wait RAN2 | Option 2 is RAN2 based solution. We can continue discussions on the options waiting RAN2. |
| Ericsson | Option 1, other options can wait RAN2 | Option 2 is RAN2 based solution. We can continue discussions on the options waiting RAN2. |
| ZTE | Option 1 | Agree with Google. |
| Xiaomi | Option 1 |  |
| Samsung | Wait RAN2 | We can wait RAN2’s decision |
| LGE | Option 2 | Agree with Lenovo and Huawei. |

**Moderator’s summary:**

12 companies provide their view.

6 companies support option 1, 4 companies support option 2/3/4, more than 2 companies think other options shall wait RAN2.

**Moderator’s proposal:**

**For the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, RAN3 waits RAN2 to enhance signalling.**

In [8], it states this new issue, the detail is as below.

|  |
| --- |
| In Rel-17, 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 or the last serving gNB completes the SDT procedure and directs the UE to continue in RRC\_INACTIVE state by sending the RRCRelease message.  Compared with Rel-17, there is a new case for DL non-SDT data arrival. The DL non-SDT data arrives at the last serving gNB following the MT-SDT paging procedure before receiving UE Context Retrieval Request message. There are several possibilities to handle the DL non-SDT data:  **Option 1:** The last serving gNB triggers regular paging upon receiving the DL non-SDT data following the MT-SDT paging. It may cause overriding issue since both MT-SDT paging and regular paging are performed at the same time.  **Option 2:** The last serving gNB buffers the DL non-SDT data. If there is no response of the MT-SDT paging for a defined time, the last serving gNB triggers regular paging. Otherwise, the last serving gNB decides to perform SDT with UE context relocation procedure and forwards the DL non-SDT data to the receiving gNB. Upon receiving the forwarded DL non-SDT data, the receiving gNB may send RRCResume message for UE entering RRC\_CONNECTED state.  Option 1 has large impact that is not preferred. For option 2, some clarification on stage 2 may be needed. As further enhancement, DL non-SDT data arrival indication may be added in Retrieval UE Context Response message so that the receiving gNB does not need to wait for data forwarding for triggering RRCResume message for UE entering RRC\_CONNECTED state.   1. The last serving gNB buffers the DL non-SDT data when the DL non-SDT data arrives at the last serving gNB following the MT-SDT paging procedure before receiving UE Context Retrieval Request message. 2. A DL non-SDT data arrival indication may be added in Retrieval UE Context Response message for the last serving gNB triggering RRCResume message earlier. |

**Question 6: For the issue on DL non-SDT data arrives at the last serving gNB following the MT-SDT paging procedure before receiving UE Context Retrieval Request message, which option do companies prefer?**

**Option 1: It is left to gNB implementation.**

**Option 2：The last serving gNB buffers the DL non-SDT data when the DL non-SDT data arrives at the last serving gNB following the MT-SDT paging procedure before receiving UE Context Retrieval Request message, and/or A DL non-SDT data arrival indication may be added in Retrieval UE Context Response message for the last serving gNB triggering RRCResume message earlier.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1**  **vs**  **Option 2** | **Comment** |
| Lenovo | Option 2 | As proponent:  At least, some clarifications on stage 2 are needed.  As further enhancement, DL non-SDT data arrival indication may be added in Retrieval UE Context Response message so that the receiving gNB does not need to wait for data forwarding for triggering RRCResume message for UE entering RRC\_CONNECTED state. |
| Huawei | Option 2, but | It is better for the last serving gNB to wait UE acces first, and if the UE access in the last serving gNB, it can move the UE to RRC\_Connected state directly. And if the UE access via a new gNB, anchor relocation will happen, and then the last serving gNB forwards the data to the new gNB after Xn-U Address Indication procedure.  But do not see the strong motivation to provide a non-SDT data arrival indication in the Retrieval UE Context Response message, as the new gNB is able to get the sdt-Config-r17 via the inter node RRC message *HandoverPreparationInformation*, and the DL data forwarding proposal in the Retrieval UE Context Response message. |
| China Telecom | Option 2 | the last serving need to buffer the non-SDT data before Xn-U Address Indication received. And one new indication is also needed in Retrieval UE Context Response message. With this information, the receiving node could send RRCRelease message to transit UE to connection state. |
| Qualcomm | Option 2 but | Same view as Huawei but we can further discuss about need of providing new indication if needed. |
| Google | Option 2 | To aid the receiving gNB to make the follow-up decision, it is beneficial to let it knows that there is incoming DL data for the UE. Can we reuse the “Data Forwarding and Offloading Info from source NG-RAN node” IE in the PDU Session Resources To Be Setup for this purpose? |
| Nokia | Option 1 | Even though we agree with the steps described by Huawei why should this be specified? |
| Ericsson | Option 1 | Same view as Nokia. Both options seem implementation specific. Not sure if any indication is needed? |
| ZTE | Option 2 | We agree with the motivation and add a new IE as proposed by Lenovo. However, we are fine to further discuss which IE can be used. |
| Xiaomi | Option 1 |  |
| LGE | Option 1 | Agree with Nokia. We think that even in Option 2 is adopted, the existing DL data forwarding proposal in the Retrieval UE Context Response message can be reused in this case. |

**Moderator’s summary:**

10 companies provide their view.

4 companies support option 1, 6 companies support option 2, some companies from 6 supporting companies wonder if the existing IE can be reused.

**Moderator’s proposal:**

**For the issue on DL non-SDT data arrives during the ongoing MT-SDT procedure, RAN3 waits RAN2 to enhance signalling.**

**RAN3 acknowledges the issue on 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, or introduce a new IE.**

**Issue 2: TP for 38.300**

Some contributions (e.g., [3], [6], [15], and [17]) provide the TS38.300 procedure.

All of them are the same from step 1 to step 3 as below.

Step 1: Last serving gNB receives DL SDT data/DL SDT signalling.

Step 2: Last serving gNB sends XnAP RAN paging including MT-SDT Information.

Step 3: Receiving gNB triggers Uu MT-SDT Paging.

From step 4, [6], [15] and [17] suggest to reuse MO-SDT. But [3] provides detail steps based on the RAN2 agreement.

In other word, [3] introduce step 4, step 5 and step 6 which are different from MO-SDT and which are agreed by RAN2.

**Step 4: UE decides to initiate MT-SDT procedure.**

Note: It is different from MO-SDT, UE does not need to pre-configure RA-SDT resource and/or CG-SDT resource

RAN2 agreement: 4. Upon receiving MT-SDT trigger, the UE shall initiate SDT procedure if the following checks are satisfied (all these same as Rel-17)

**Step 5: UE sends an RRCResumeRequest for MT-SDT to the receiving gNB.**

Note: It is different form MO-SDT, UE shall send a bit indicator within RRCResumeRequest.

RAN2 agreement: 7. New Resume cause in RRC resume will be introduced, one code point MT-SDT indication

**Step 6: Receiving gNB sends Retrieve UE context request including resume indicator to anchor gNB.**

Note: It is FFS that the resume indicator is either reuse existing SDT indicator or a new MT-SDT indicator or a new Cause value.

Step 7: The same as legacy MO-SDT procedure.

Moderator thinks at least step 4 and step 5 as above are different from MO-SDT procedure, it is suggested to describe at least step 4 and step 5 in the overall MT-SDT procedure.

|  |
| --- |
| 18.X MT-SDT with/without UE context relocation The overall procedure for MT-SDT procedure with/without UE context relocation is illustrated in the figure 18.X-1.    Figure 18.X-1. MT-SDT with/without UE context relocation  1. DL data and/or DL NAS signalling are received at the last serving gNB for the UE in RRC\_INACTIVE state.  2. When receiving DL SDT user data and/or DL SDT NAS signalling, the last serving gNB may send MT-SDT information IE to the neighbour gNBs within the RNA, via XnAP RAN paging message.  *Editor’s Note: FFS on MT-SDT indicator.*  3. The gNB that receives MT-SDT information within the RNA takes into account this information received in the XnAP RAN PAGING message from the last serving gNB to decide whether to trigger MT-SDT Paging.  4. The UE decides to initiate MT-SDT procedure.  5. The UE sends an RRCResumeRequest for MT-SDT to the receiving gNB.  Editor’s note: Based on RAN2 agreement: New Resume cause in RRC resume will be introduced, one code point MT-SDT indication  6. 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 MT-SDT.  Editor’ note:  *Editor’s note: It is FFS whether to reuse existing SDT indicator for receiving gNB to indicate that the UE request is for an MT-SDT.*  7. The following steps are the same as Figure 18.2-1/18.3-1 from step 3. Except that the first SDT user data/NAS signalling is DL SDT data and/or DL SDT NAS signalling |

**Question 7: Do companies agree that at least step 5 and step 6 are different from MO-SDT procedure and shall be described in the overall MT-SDT? If yes, do companies agree with overall MT-SDT as above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | Yes |  |
| Huawei | Neutral | No strong view, but we also do not see strong need to have separate step 4, 5, 6 as separate steps, as we can say something like  The UE initiates MO-SDT procedure as described in clause 18.2 or 18.3 with the following differences:  - the UE sends *RRCResumeRequest* message with the resume cause ‘mt-SDT’, and may be without user data and/or signalling.  And based on the proposal 2 above, there is no need to have the description of the MT-SDT indicator in step 6. |
| China Telecom | yes |  |
| Qualcomm |  | See above comments for steps 4,5 and 6.  Moderator:  The step 4 is removed, it is pure RAN2 issue.  The step 5 is revised to The UE sends an RRCResumeRequest for SDT to the receiving gNB, add an EN as below.  Editor note: It can be revisited by RAN2 progress. |
| Google | Neutral | Like the Stage 2 issue 1 and our paper [18], there could be other possible scenarios for the UE to react to the Uu Paging. Therefore, for steps 4, 5, 6, it may be sufficient to refer to 18.2, 18.3 or 9.2.2 and add the differences if needed.  Moderator: Step 4/5 is different from MO-SDT according to the RAN2 progress, e.g., whether RA-SDT resource or normal RACH resource is used for RRCResumeRequest message. |
| Nokia | Yes but | But needs some updates based on the agreements of this meeting.. |
| Ericsson | Yes | The TP looks fine in general. The understanding from RAN2 agreements is that UE can follow any of these paths:  1) Initiate MT-SDT procedure as answer to the page, in this case it follows legacy RA page resource.  2) Initiate MO-SDT procedure, if it the preconditions for this are met  In light of this, the comments from QC on steps 4&5 make sense. |
| ZTE | Yes | To QC and E///: For step 4&5, we can leave the detail to RAN2.  For information, my RAN2 colleague told me it is the corner case that UE initiates MO-SDT while receiving MT Uu paging. |
| Xiaomi | Yes | The wording of 4 may need more discussion, it seems strange to us that UE initiate MT-SDT, we understand the intension, but want to look for a better wording.  Moderator: OK, the step 4 is removed, it is pure RAN2 issue. |
| Samsung | Yes |  |
| LGE | Yes | We are also OK with Huawei’s suggestion. Step 6 can be updated based on the result of Q2. |

**Moderator’s summary:**

11 companies provide their view.

8 companies support the TP to TS38.300 with some rewording, no company objects it.

**Moderator’s proposal:**

**Capture the TP to 38300, it will be fixed in the 2nd round.**

**Issue 2: TP for 38.420**

|  |
| --- |
| 5.2.11 Small data transmission function5.2.11.1 General This function supports small data transmission sessions in RRC\_INACTIVE both with and without anchor relocation. 5.2.11.2 Partial UE Context Transfer function The Partial UE Context Transfer function is used for the last serving NG-RAN node to provide part of the UE Context to the receiving gNB. 6.2.12 Small data transmission procedures - Partial UE Context Transfer: enables exchange of information between NG-RAN nodes for SDT transmission without anchor relocation  Small data transmission is also supported by the following procedures:  - RRC Transfer  - Retrieve UE Context Confirm  - RAN Paging |

**Question 8: Do companies agree with the 38.420TP within [8], as above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Lenovo | Yes |  |
| Huawei | No for the first change,  Yes for the second change. | For the first change, all the SDT related XnAP procedures are only applicable in case the UE is served by a new NG-RAN node, seems no need to remove it.  Ok to have the second change. |
| China Telecom | No for |  |
| Google | Yes for the second change |  |
| Nokia | No | For the first change, all the SDT related XnAP procedures are only applicable in case the UE is served by a new NG-RAN node, seems no need to remove it.  For the second change, we usually list in the procedures only the ones for which specifications were updated due to the support of the function. This is not the case for RAN Paging. Otherwise, we would need to list for any function all procedures which happen to be used… |
| Ericsson | No | Agree with Nokia |
| ZTE | Yes | Agree with change 1. Because MT-SDT paging will broadcast to all of RAN node within whole RNA area, which is different from MO-SDT which is restricted in a certain new NG-RAN node.  Agree with change 2. Because RAN paging for MT-SDT shall be enhanced, which is included in the scope of current WID. |
| Xiaomi | No | Agree with Nokia |
| Samsung | Yes for the second change |  |
| LGE | No | Agree with Nokia |
|  |  |  |
|  |  |  |
|  |  |  |

**Moderator’s summary:**

10 companies provide their view.

5 companies support the TP to TS38.420 with 1st and/or 2nd change. 5 companies does not support it.

**Moderator’s view:** At least the second change is useful, because RAN paging shall be enhanced to add a new function for MT-SDT procedure, which is similar to the RRC Transfer and Retrieve UE Context Confirm used in MO-SDT.

**Moderator’s proposal:**

**Try to Capture the TP to 38420 including the 2nd change, it will be fixed in the 2nd round.**

## Other Issues

**Question 9: Do companies have other issues to be discussed? If any, please input them.**

In last meeting, there was an FFS:

* FFS: whether MT-SDT support indication in E1 Bearer Context procedure should be defined to enable the gNB-CU-UP to include the DL data size in the E1AP DL DATA NOTIFICATION message.

Better to discuss this topic as well to solve the FFS.

From our view, by default, the gNB-CU-CP and the gNB-CU-UP can know the features supported by each other based on OAM configuration. But as for MT-SDT, the gNB-CU-UP will need to sum up the data size for the DL SDT Data and provide such information to the gNB-CU-CP, it is clear that the gNB-CU-CP should not do this for all UEs, or all UEs with SDT DRBs (there could be UEs only support MO-SDT but not MT-SDT). Therefore, it is preferred to include an indication in the E1AP: BEARER CONTEXT SETUP REQUEST message to enable the gNB-CU-CP to request the gNB-CU-UP to provide MT-SDT Information in the E1AP DL Data Notification.

|  |  |  |
| --- | --- | --- |
| **Proposal X: Include a *MT-SDT Information Request* IE in the E1AP: BEARER CONTEXT SETUP REQUEST message to request the report of MT-SDT Information.Company** | **Yes/No** | **Comment** |
| Huawei | Yes | Otherwise the gNB-CU-UP will has to sum up the data size for all UEs or all UEs with SDR DRBs (there could be UEs only support MO-SDT but not MT-SDT). |
| China Telecom | yes |  |
| CATT | Yes | Seems reasonable. |
| Qualcomm | Yes | Some R18 UEs may not support MT-SDT but supports only R17 MO-SDT. So it is reasonable to let CU-UP knows about UE support of MT-SDT per DRB level. |
| Google | Yes |  |
| Nokia | Yes |  |
| Ericsson | Yes |  |
| ZTE | No/but | Assume both CU-CP and CU-UP know per node’s capability of MT-SDT by OAM. Then the only the UP supporting MT-SDT feature will report the sum up of MT-SDT data size. So we do not think it is useful.  However, we can follow majority company’s view. |
| Xiaomi | Yes with comments | Although we think this is not that critical to support, we understand the intension and ok to support if it’s majority’s view.  But should this indication be included in the bearer context modification request message instead of bearer context request message? As the SDT is configured after DRB setup, if our understanding is correct. |
| Samsung | Yes | In general, we agree this IE is helpful. However, the detailed information need further discussion. One possible information is that MT-SDT bearer indication per DRB. On the other hand, the CU-UP may need to know the data volume threshold of determining SDT. |
| LGE | Yes |  |
|  |  |  |
|  |  |  |

**Moderator’s summary:**

11 companies provide their view.

10 companies support the Proposal, 1 companies can also support it.

**Moderator’s proposal:**

**Include a MT-SDT Information Request IE in the E1AP: BEARER CONTEXT SETUP REQUEST message to request the report of MT-SDT Information.**

#### 9.2.2.4 BEARER CONTEXT SET UP REQUEST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Message Type | M |  | 9.3.1.1 |  |
| gNB-CU-CP UE E1AP ID | M |  | 9.3.1.4 |  |
| gNB-CU-UP UE E1AP ID | M |  | 9.3.1.5 |  |
| <Skip unchanged part> | | | | |
| MT-SDT Information Request |  |  | ENUMERATED (true, …) | Indicates to request the report of MT-SDT Information. |

Editor’s note: FFS on the need of BEARER CONTEXT MODIFICATION REQUEST message.

**One additional stage 2 issue was missing for TS 38.401 BLCR as described for [18] to describe other possible scenario that the UE chooses to perform.**

|  |
| --- |
| 8.18.x MT-SDT  The procedure for mobile terminated small data transmission in RRC Inactive is shown in Figure 8.18.x-1.    **Figure 8.18.x-1: Mobile Terminated Small Data Transmission in RRC Inactive state.**  1a-0. The gNB-CU-UP receives DL SDT data for the UE in RRC Inactive on NG-U interface.  1a-1. The gNB-CU-UP sends DL DATA NOTIFICATION message to the gNB-CU-CP. If supported, the gNB-CU-CP includes the MT-SDT assistance information in the DL DATA NOTIFICATION message.  1b. The gNB-CU-CP receives DL signalling over NGAP.  2. After 1a or 1b, the gNB-CU-CP sends PAGING message to the gNB-DU. The MT-SDT information may be included in the PAGING message.  Editor’s Note: the MT-SDT information is MT-SDT indicator and/or (FFS: MT-SDT assistant information)  3. The gNB-DU sends the *Paging* message including the MT-SDT indication to the UE.  Editor’s Note: whether gNB-DU can make further decision on MT-SDT paging is FFS.  4. (FFS) If the UE has been successfully reached, it initiates the SDT procedure as described in 8.18.1 or from step 9 in 8.18.2 or from step 1 in 8.18.3 with the following difference or the RRC connection resume procedure as described in 8.6.2 or 8.9.6.2:  the UE indicates the RRC Resume Request is for MT-SDT, which may be without UL data.  Editor’s Note: FFS on other differences and whether separate flow is needed or not.  Editor’s Note: step 4 should take RAN2 agreement into account. |

**Question Y: Do companies agree with the 38.401TP within [18], as above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Google | Yes | We are the proponent of the TP and think that the other scenarios should be considered as well. |
| Nokia | OK |  |
| ZTE | OK |  |
| Xiaomi | Ok |  |
|  |  |  |

**Moderator’s summary:**

4 companies provide their view.

4 companies support the TP to 38401, no company objects it..

**Moderator’s proposal:**

**Capture the TP to 38401, it will be fixed in the 2nd round.**

# Conclusion, Recommendations

# References

1. [R3-231186](D:\\会议硬盘\\TSGR3_119bis-e\\Docs\\R3-231186.zip) Signaling enhancements to enable MT-SDT for RRC\_INACTIVE UEs. (Qualcomm Incorporated) discussion
2. [R3-231233](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231233.zip) Introduction of MT-SDT (ZTE, China Mobile, China Telecom) draftCR
3. [R3-231234](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231234.zip) (TP to 38.423, 38.473, 37.483) Introduction of MT-SDT (ZTE) other
4. [R3-231285](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231285.zip) (TP for TS 38.423) Discussion on MT-SDT Open Points (Nokia, Nokia Shanghai Bell, Orange) other
5. [R3-231286](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231286.zip) (TP for TS 37.483) Support of Paging Triggered MT-SDT (Nokia, Nokia Shanghai Bell, Orange) other
6. [R3-231395](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231395.zip) (TPs to TS 38.300, 38.423 BL CRs) Consideration on MT-SDT (Huawei) other
7. [R3-231396](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231396.zip) (TPs to TS 38.401, 38.473 and 37.483 BL CRs) MT-SDT in disaggregated architecture (Huawei) other
8. [R3-231451](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231451.zip) (TP to TS 38.420) Support for Paging-Triggered SDT (Lenovo) other
9. [R3-231527](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231527.zip) Discussion on leftover issues of MT-SDT (Xiaomi) discussion
10. [R3-231581](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231581.zip) Support of MT-SDT in Split Architecture (China Telecom) discussion
11. [R3-231582](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231582.zip) Discussion on MT-SDT Procedure (China Telecom) discussion
12. [R3-231639](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231639.zip) Discussion on MT-SDT open issues (Ericsson) discussion
13. [R3-231640](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231640.zip) (TP to TS 38.473 BL CR for MT-SDT): Support of MT-SDT Paging (Ericsson) other
14. [R3-231671](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231671.zip) Further discussion on MT-SDT (CATT) discussion
15. [R3-231672](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231672.zip) (TP for MT-SDT BL CR to TS 38 300) Support of MT-SDT (CATT) other
16. [R3-231695](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231695.zip) (TP to TS 38.423, 38.473 and 37.483) Support of MT-SDT (LG Electronics) other
17. [R3-231696](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231696.zip) (TP to TS 38.300 and 38.401) MT-SDT Support (LG Electronics) other
18. [R3-231785](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231785.zip) (TP for MT-SDT BLCR to TS 38.401) UE reaction to the Paging (Google Inc.) other
19. [R3-231838](file:///D:\会议硬盘\TSGR3_119bis-e\Docs\R3-231838.zip) Discussion of remaining issues on MT-SDT (Samsung) discussion