**3GPP TSG-RAN2#125 R2-24xxxxx**

**Athens, Greece, Feb. 26th – Mar. 1st, 2024**

**Source: ZTE Corporation(rapporteur)**

**Title: Report of [POST125][026][MT-SDT]: Harmonising the handling of *SDT ongoing* and *T319a***

**Agenda item:** **7.18.1**

**Document for:** **Discussion and Decision**

# Introduction

This document is used to discuss the harmonisation of SDT ongoing/not ongoing labels and T319a in RRC/MAC specs per the following:

[POST125][026][MT-SDT] Fix “ongoing” procedure (ZTE)

Intended outcome: Review updated changes to “ongoing” procedure and identify any additional issues/clarifications needed. Provide agreable CR as input to next Plenary.

Deadline: Long

# Discussion

# Analysis of RRC spec

Currently, in various checks are done to ascertain whether SDT is ongoing or not and based on this, different UE behaviour is defined for the UE. This is summarised in the Figure 1 below:

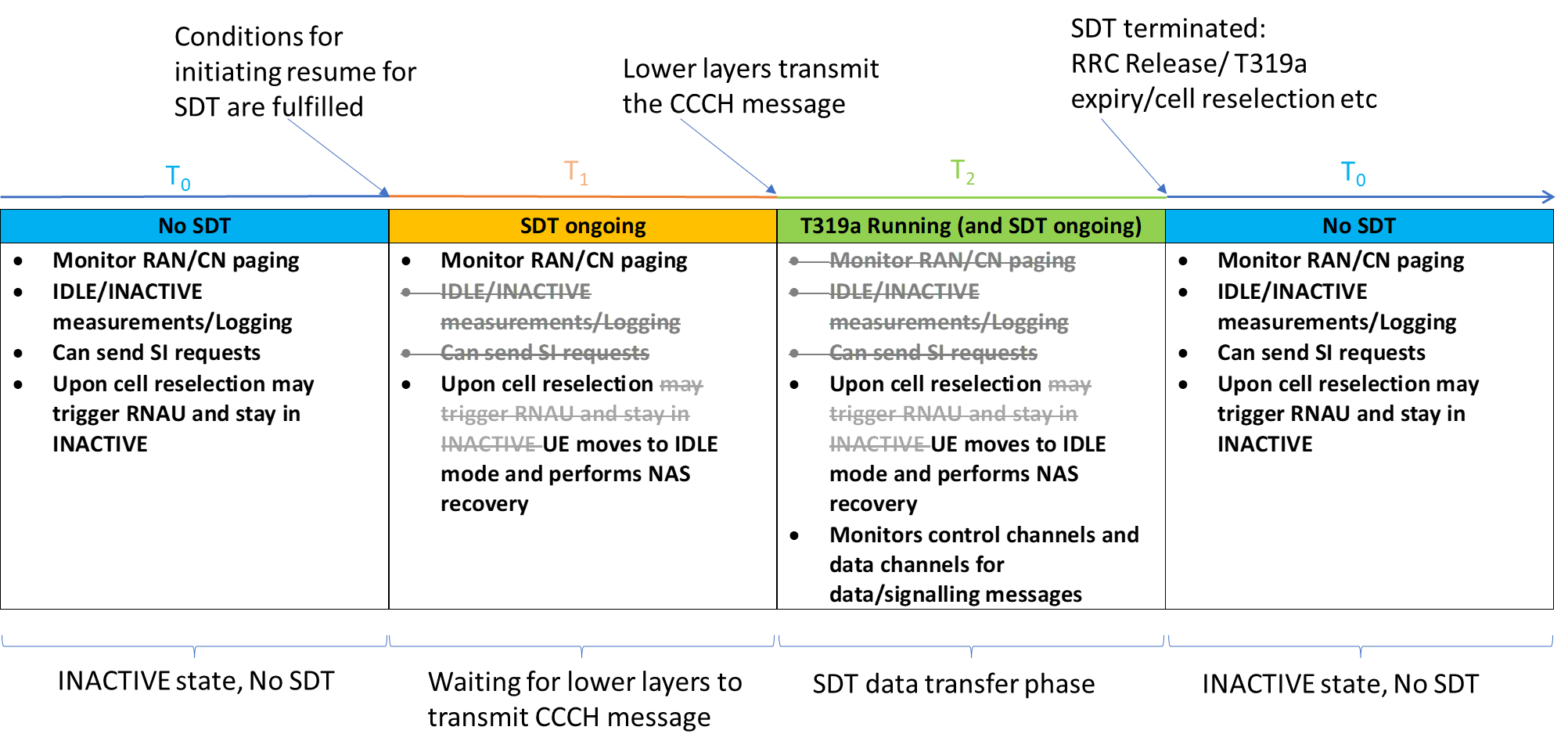


Figure 1: Overview of SDT handling in RRC

As noted above, SDT is considered to be ongoing immediately after conditions for SDT are fulfilled whilst T319a is started only upon the lower layers first transmitting the CCCH message. UE behaviour is different before and after T319a is started in this case as shown above. In Rel-18 the time duration between the point when SDT is considered ongoing and T319a is eventually started (i.e. possible duration of T1) has been extended because of the extended CG periodicities. The main point to emphasise in Figure 1 is that upon considering that SDT conditions are fulfilled in RRC, UE behaviour changes (see the transition from T0 to T1 in the figure above). This is the reason why use the label “SDT ongoing” in the current RRC spec.

**Observation 1: Per the current RRC specification:**

1. **SDT is ongoing**: From the point when conditions for SDT are fulfilled until SDT is terminated
2. **T319a runs**: From the point when MAC first transmits the CCCH message until the SDT is terminated. It should be noted that SDT is considered ongoing during this period of time. i.e. while T319a is running SDT is ongoing too.
3. **When SDT is ongoing but T319a is not running:** UE is waiting for lower layers to transmit the CCCH message and the UE behaviour is different in this time period compared to the UE behaviour immediately before SDT conditions are satisfied (The difference is in IDLE/INACTIVE measurements, logging of available measurements (see sections 5.5a.3.2, 5.7.8) and cell reselection behaviour (see section 5.3.13.6)).

First companies are asked whether the they agree with the above observation with respect to the current RRC spec.

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| **Q1: With regards to the modelling of *SDT ongoing* label and *T319a* timer in RRC, do companies agree with observation 1 above** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes |  |
| LGE | Yes |  |
| Huawei, HiSilicon | Yes | Additionally, the following is captured in the RRC specifications:  “NOTE 1: The UE in RRC\_CONNECTED is only required to acquire broadcasted *SIB1* and MBS broadcast if the UE can acquire it without disrupting unicast or MBS multicast data reception, i.e., the broadcast and unicast/MBS multicast beams are quasi co-located. The UE in RRC\_INACTIVE state while SDT procedure is ongoing, is only required to acquire broadcasted *SIB1* and *MIB* if the UE can acquire them without disrupting unicast data reception, i.e. the broadcast and unicast beams are quasi co-located.”  This requirements relaxation is due to the fact that the UE was supposed to be monitoring control channels and transmitting/receiving data while the SDT procedure is ongoing, but the UE only does that when T319a is running, so this note is currently incorrect.  Rapporteur: This is a valid observation. We can attempt to fix this. |
| ZTE | Yes |  |
| Intel | Yes, with comments | When RAN2 agreed to change the start instance of T319a to be at the time that the 1st CCCH msg is transmitted (instead than when *RRCResumeRequest* for SDT was sent to the lower layers), this created an additional new/intermediate UE states/behaviours (which is shown in yellow in above diagram). As we commented at the time during the RAN2#123bis meeting discussion, we did not support this approach that seems to add unnecessary complexity to UE. |
| Sharp | Yes |  |
| Qualcomm | Yes |  |
| MediaTek | Yes |  |
| CATT | Yes |  |
| Summary:  All companies agree observation 1 above. So, it seems that the current RRC spec it self is clear with regards to the procedure. However, one company rightly pointed out that the behaviour of the UE for acquiring broadcasted SIB1 and MIB should be conditional on T319a and not on SDT ongoing as per the current Note. This may need to be fixed.  **Proposal 1: Clarify that “The UE in RRC\_INACTIVE state while T319a is running ~~SDT procedure is ongoing~~, is only required to acquire broadcasted *SIB1* and *MIB* if the UE can acquire them without disrupting unicast data reception, i.e. the broadcast and unicast beams are quasi co-located.” – Apart from this the UE behaviour in RRC as specified currently is clear.** | | |

At RAN2#125, it was discussed to harmonise the labels for SDT ongoing/not ongoing and T319a start. For this the following options exist:

Option A: Consider SDT as ongoing at the same time as T319a start

Option B: Start T319a at the same time as SDT is considered ongoing

The issue with option B is that T319a may expire before the lower layers actually transmit the CCCH message. So, if we go with option B, some further discussion is needed, e.g. to not actually count down T319a until lower layers transmit the CCCH message etc. Such handling of timer doesn’t really exist in the specs today. In R2-2400585, option A was proposed. So, first we can check whether companies agree that we attempt to harmonise this using option A.

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| **Q2: Do companies agree that we should attempt to specify option A (but not option B)?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes | It seems also to be significantly less impact to the specifications with option A. |
| LGE | Yes |  |
| Huawei, HiSilicon | Yes | Going back to option B should not be considered as it will cause the issues that we wanted to avoid in the first place (by decoupling T319a from SDT ongoing), as described by the rapporteur. |
| ZTE | Yes | Option B will anyway need some handling for paging monitoring. So, there seems to be no benefit of attempting option B. |
| Intel | Yes | The intention not to start T319a before actual sending CCCH msg was because the timeout of T319a triggers an abrupt termination (failure) of the SDT procedure and this should not happen if UE has to wait for long time before having UL resources available to send the 1st CCCH msg (e.g., when using a long value for the CG-SDT periodicity).  This option A) could easily be enabled as follows:  1> if conditions for initiating SDT in accordance with 5.3.13.1b are fulfilled:  2> consider the resume procedure is initiated for SDT;  2> start timer T319a when the lower layers first transmit the CCCH message;  2> consider SDT procedure is ongoing when the lower layers first transmit the CCCH message;  1> else:  2> start timer T319;  2> instruct the MAC entity to stop the *cg*-*SDT*-*TimeAlignmentTimer*, if it is running; |
| Sharp | Yes |  |
| Qualcomm | - | We fail to see why we need to harmonise the labels for SDT ongoing/not ongoing and T319a start. i.e., no need to change current spec. |
| MediaTek | No | Agree not to consider option B. However, option A introduces functional NBC change to Rel-17 RRC behaviour that we never agree.  Rapporteur: The concern is noted. However, just want to clarify that there is no intention to change anything in Rel-17. The intention is only to change Rel-18. Wonder if this mitigates the concerns a bit. But we can check this online. |
| CATT | Yes |  |
| **Summary:**   * Majority of companies (7/9) agree with the intention to specify option A. * Two companies (Chipset vendors) are concerned about this. The concern mainly seems to be that this is an NBC change (functionally) and is hence not acceptable. Rapporteur wonders if changing only from Rel-18 as intended would mitigate these concerns.   **Proposal 2: Discuss whether we can specify option A – i.e. Consider SDT as ongoing at the same time as T319a start (7/9)** | | |

However, if we go with option A, then, the question is whether we still allow the UE behaviour to be different before and after T319a starts. Specifically, the UE behaviour for the following aspects needs to be kept in mind:

1. Paging monitoring:

For paging monitoring, we explicitly agreed that before T319a start UE shall monitor paging and may initiate a new resume procedure if conditions are fulfilled. But after T319a starts, UE doesn’t monitor paging for MT data (i.e. follows same approach as in connected state). Rapporteur thinks that this behaviour shall be retained as agreed (as otherwise there will be a long duration when the UE may be waiting for the lower layers to transmit the CCCH message but won’t monitor paging especially with longer CG periodicities in Rel-18). It should be noted that option A above would not impact this because currently we check whether T319a is running or not for the paging monitoring (so, even if we move SDT ongoing label to T319a start, there is no impact). However, if we went with option B, then this procedure will be impacted and we will then need to discuss how to specify that UE still monitors paging until CCCH message is transmitted.

1. IDLE/INACTIVE measurements (see sections 5.5a.3.2, 5.7.8)

IDLE/INACTIVE measurements were excluded during SDT in Rel-17 and specified like this since Rel-17. So, for this behaviour, there is no difference before and after T319a start. However, the behaviour is different to the UE behaviour before SDT is initiated. Option A will impact this procedure because currently we check whether SDT is ongoing or not for this and if we go with option A, then UE behaviour will need to be discussed during the period until T319a starts.

1. SI requests

SI request may involve a new RACH procedure and to avoid the complexity of interactions with an ongoing SDT procedure it was agreed in Rel-17 that UE is not allowed to initiate SI request procedure once SDT conditions are fulfilled. Also, for this, there is no difference in UE behaviour before and after T319a start, but the UE behaviour is different to the behaviour before SDT is initiated. Again, Option A will impact this procedure because currently we check whether SDT is ongoing or not for this and if we go with option A, then UE behaviour will need to be discussed during the period until T319a starts.

1. Cell reselection

Cell reselection would render the CCCH message submitted to lower layers invalid. So, the lower layers shall not transmit the submitted CCCH message in the new cell. Optimisations are possible here to stop the lower layers from transmitting the old CCCH message and initiate a new resume procedure (this would then be similar as receiving a paging message whilst waiting for lower layers to transmit CCCH message, so this is feasible in theory). But we did not discuss such optimisation so far and hence currently, the UE moves to IDLE mode in this case (i.e. no optimisation) and performs NAS recovery. Again, option A will impact this procedure.

Given the above background, in case we go with option A, the first question is if we still maintain the current UE behaviour unchanged (at least for some cases) before T319a is eventually started (especially see items 2), 3) and 4) above).

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| **Q3: For option A, do companies agree that the UE behaviour for paging monitoring, IDLE/INACTIVE measurements, SI requests and cell reselection still needs to be kept unchanged during T1 (i.e. whilst lower layers are waiting for CCCH transmission) in Figure 1?** | | |
| Company | Yes/No | Comment (please explain in the comments if some aspects need to be changed and explain why) |
| Ericsson | No | Seems like the behaviour of T0 could be extended up until the start of T2 (T319A started) for 2), 3) and 4) above. Essentially, the SDT decision does not impact anything in our mind and the CCCH message is the only visible sign outside the UE. |
| LGE | No | Agree with Ericsson. UE can perform the addressed UE behaviour until T319a starts same as T0. |
| Huawei, HiSilicon |  | For 1), we agree there is no impact.  For 2) and 3), the UE can simply behave as in time T0 in the figure as the SDT procedure would not be ongoing during this time. There seems nothing to be discussed in this case.  For 4), Similarly as above, the UE will behave as if the SDT procedure was not ongoing, so UE would perform normal cell reselection. What might need to be specified is for the UE to cancel sending of the CCCH message and initiate a new resume procedure (i.e. check the SDT conditions again etc.). |
| ZTE | No | If we attempt option A, we think we should make the UE behaviour to be same in T1 as it is in T0. Otherwise, there will still be some need for different specification and checks. |
| Intel | No | Agree with Ericsson. |
| Sharp | No | Share the view with Ericsson. |
| MediaTek | Yes | 1) is a key requirement that should be kept. Meanwhile we would like to indicate the Rel-18 clarification to this part hasn’t been aligned with in Rel-17 spec (see the bullet 2 of our comment in Q6).  Rapporteur: True that Rel-17 was left unchanged. This was intentional. There is no big issue in Rel-17 because the duration of T1 is not really that long. With extended CG periodicities, T1 becomes quite long and hence we had to change this in Rel-18.  In 2), it changes UE measurement behaviour during *RRCResume* procedure for SDT.  For 3), the UE should not trigger SI request while UE is waiting for lower layers to transmit CCCH for SDT. Otherwise, the two RAs might then occur at the same time.  Rapporteur: Just to clarify, option A would mean that the UE would cancel the SDT procedure and initiate an SI request procedure in its place. So, there will be no two RAs at the same time.  For 4), a cell reselection during resume/SDT procedure (also when the UE is waiting for the lower layers to transmit CCCH for SDT) should cause a transition to RRC\_IDLE. Otherwise, RNA Update might get triggered and RAN2 has earlier agreed that only one resume procedure can be ongoing at any point in time.  Rapporteur: Again, the intention is that the UE would completely cancel the previous SDT procedure and can initiate a new procedure in new cell – this is same as if the UE is paged i.e. 1) above. However, it is true that this is a functionally NBC change.  So, for 2), 3) and 4) we shall keep the procedures as is. |
| CATT | No(with comments to (4)) | For 1)2)3), we agree that the same behaviours can be extended to T1.  For 4), we think we need to discuss UE’s behaviours during T1. Since during this time period, UE have already prepared the CCCH message and performed the configuration restore, if UE perform cell reselection during this time, how to handle the CCCH message and the configuration need to be specified. Besides, after UE change the cell, whether the UE will go to IDLE state with release cause “RRC Resume failure” or re-evaluate the SDT condition and initiate new resume procedure need more discussion.  Rapporteur: The intention is that the UE would simply reinitiate a new procedure in the new cell. We can discuss how to capture this, but we captured UE behaviour in a simple way for 1) above for a similar scenario. |
| **Summary:**   * Majority of companies agree that the UE behaviour in T1 should be aligned with the behaviour in T0. * One company pointed out that this would require a different UE behaviour and is hence not preferable * There were some comments on how to specify the UE behaviour for cell reselection in this case but rapporteur thinks this is similar to how we specified the paging case above. So, this can be done in a similar way.   **Proposal 3: Discuss whether we can align the UE behaviour in T1 (i.e. whilst waiting for CCCH message to be transmitted by lower layers) to the behaviour in T0 (before initiating SDT) – (7/8)** | | |

If there is still some difference in UE behaviour before T319a starts (as is the case currently), then specifying this different behaviour would need some check in RRC (currently we check whether SDT is ongoing), if this is the case, then moving the current label of “SDT ongoing” to the same time as T319a start point seems an artificial change (may be, we have to check a different label like lower layers are waiting for CCCH transmission etc, but the benefit of this is unclear). This will need some case-by-case analysis in RRC to specify the different UE behaviour and can be done based on the actual CR if companies still prefer this (depends on answers to Q3 above).

On the other hand, if we change the UE behaviour during this period (e.g. to match the UE behaviour whilst T319a is running), then this is not an editorial exercise anymore. Especially if we were to change the behaviour for IDLE INACTIVE measurements, logging and cell reselection behaviour.

So, we can check first if companies are still willing to unify the T319a start and SDT being considered ongoing at the same point in time even if there are differences in UE behaviour before and after T319a starts.

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| **Q4: If at least some of the UE behaviour during T1 is different to the UE behaviour during T0, do companies still prefer option A to harmonise the SDT ongoing label with T319a start point?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes |  |
| LGE | Yes | But, if there is difference between T0 and T1, it would be better to name the T1 explicitly, e.g. “SDT preparation”. |
| Huawei, HiSilicon | Yes | As we clarified above, by moving the point of when “SDT procedure is ongoing” to the point where currently T319a is started (i.e. when CCCH message is sent), we do not have to modify UE behaviour too much. Before “SDT procedure is ongoing” the UE would behave in the same way as it is currently behaving when ”SDT procedure is not ongoing”, i.e. as shown in T0 in then figure above. The only additional point we need to handle is to clarify that after the cell reselection the resume triggered in the previous cell is cancelled. |
| ZTE | No | We think ideally, we should make the UE beharviour in T1 same as T0 so that we can then make the SDT ongoing at the same point as T319a start. Without this, we are not exactly sure about the benefits of this. |
| Intel | Yes | As explained in Q3, the UE behaviour in T0 and T1 should be the same. |
| Sharp | Yes |  |
| MediaTek | No | We think the two labels exist in current RRC spec for a reason. Take option A to harmonize two labels regardless of current differences clearly introduces functional NBC changes. |
| CATT | Yes | As mentioned above, UE behaviours in T1 is different from the behaviours in T0. |
| Qualcomm | No | We also think there are reasons to have two labels in current RRC spec. We fail to see the motivation or benefits to harmonise the two labels if spec is no problem. |
| **Summary:**   * Majority of companies agree that even if the UE behaviour in T1 is different to that in T0, still some harmonization can be done. * One company thinks that if the UE behaviour is different in T0 and T1 then we do need some labels anyway to check * Two companies point out that the existing checks in RRC are there for a reason and shall be kept as is. * Rapporteur view: It is unclear if we need any explicit proposal for this. Let us first discuss other proposals and then we can see if we have a way forward. So, explicit proposal made for this for now. | | |

If SDT is considered ongoing at the same time as T319a start, then in RRC, it would seem to be unnecessary to have two separate labels for the same event (we can simply rely on T319a start in this case). The reason why we have two labels now is because we have different UE behaviour and the two labels come into effect at different points in time. If they refer to the same event, then it seems maintaining both is not useful in RRC. Companies are asked whether we should then simply get-rid of the SDT ongoing/not ongoing labels if we go with this approach.

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| **Q5: If we go with option A, then should we clean-up RRC and get rid of the SDT ongoing/not ongoing labels in RRC and simply rely on T319a running/not running?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes | Should be unified. Up until CG-SDT extended periodicities there was only one label. Preferably we could rely on the T319a instead of SDT procedure ongoing. |
| LGE | No | We want to align the terminology between RRC and MAC. If we use “T319a running”, it is not proper to specify T319a in MAC. Thus, we prefer to keep “SDT ongoing”, and clean-up both RRC and MAC with this terminology. |
| Huawei, HiSilicon | Rather not | We would prefer to keep the current “SDT procedure is ongoing” label as it is clearer. However, we do not have a strong view on this. |
| ZTE | Yes | If T319a and STD ongoing happens at the same point, it would be better to refer to the same label in RRC. So, we support this simplification. |
| Intel | Neutral | We are ok to keep T319a running only as well as both as soon as it is clear that there is no intermediate UE behaviour and it is the same when saying “T319a is running” and “SDT is ongoing”. |
| Sharp | Yes | We prefer a simple way, i.e. relay on T319a. |
| Qualcomm | No | Option A changes the UE behaviour just for the purpose to align with the SDT ongoing and T319a starts which we don’t think it is necessary if current spec is no problem. We fail to see the motivation. Thus, no change on RRC is needed. |
| MediaTek | See comment | Agree the intention of the question, but we don’t support to get rid of the two labels. |
| CATT | Maybe not | We are fine to have a unified solution and slightly prefer to use the SDT ongoing. As in MAC spec, there are several places using CG-SDT ongoing and we agree with LGE that T319a seems not proper in MAC sepc. We can just clarify the definition of SDT ongoing in RRC spec.  Rapporteur: We should certainly not introduce T319a in MAC spec. The labels in MAC spec should be self-explanatory (within the MAC spec) in rapporteur’s opinion. |
| **Summary:**   * The views on this are a bit mixed, with a few companies having no strong view on this.   + Get rid of SDT ongoing label in RRC (4/9)   + No strong view but okay to go with above (3/9)   + Keep both labels (2/9) * We can try the slight majority view (which may be acceptable to 7/9 companies   **Proposal 4: If P2 and P3 are agreed, then attempt to clean-up RRC spec such that we rely on T319a running or not and get rid of SDT ongoing/not ongoing labels (may be acceptable to 7/9)** | | |

Finally, even if we don’t go with option A, rapporteur wonders if there is some further clarification needed in RRC to clarify the SDT ongoing/not ongoing labels to improve the spec readability/understanding.

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| **Q6: Regardless of option A, do companies think there is some other clarification needed in RRC to clarify the SDT ongoing/not ongoing checks?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes | Prefer to have it clarified in the definitions chapter so it will be visible that an SDT procedure can be either ongoing or not ongoing. |
| LGE | Yes | We prefer to clarify the definition of “SDT ongoing” clearly, and use this terminology for both RRC and MAC. |
| Huawei, HiSilicon | Yes | We think we should harmonise, but if we decide not to, it would be worth clarifying this somewhere, either in 38.331 or at least in 38.300. |
| ZTE | May be no | If we don’t go with a full clean-up, then we would prefer to keep everything as it is. |
| Intel | Maybe | This could be revisit after/when the CR is drafted. |
| Sharp | Yes |  |
| MediaTek | No with comment | 1. Regarding this harmonization discussion, we think related parts in current RRC spec is fine and no need to change it. 2. (**Not in the scope of this discussion but relevant**) As we indicated in Q3. The Rel-18 clarification regarding PAGING monitoring in section 4.2.1 of 38.331 actually changes Rel-17 UE behaviour. Even we understood the background, from high level view and for ecosystem health, we should strive to keep the same behaviour for Rel-17 function in Rel-17 and Rel-18 specs. Since this part seems not controversial, we might bring some discussion and/or proposal for Rel-17 SDT in maintenance session. |
| CATT | Yes | We prefer to clarify the definition of SDT onging in RRC spec and add the reference in MAC spec. |
| **Summary:**   * If P2/3 are not agreeable, then companies still seem to prefer some clarification for SDT-ongoing/not-ongoing in RRC spec. We can discuss this based on a CR, but first we can attempt via option A and see where we are.   **Proposal 5: If P2 and P3 are not agreed, then attempt to clarify when SDT is considered ongoing (e.g. in definitions section)** | | |

# Analysis of MAC spec

MAC has the following labels:

* CG-SDT procedure ongoing / not ongoing
* SDT procedure ongoing / not ongoing

However, there seems to be no formal definition within the MAC spec for when to consider the CG-SDT and SDT procedure to be ongoing or not. It is also the case that the SDT ongoing/not ongoing within MAC is not associated with the same conditions in RRC discussed above in section 2.1 (e.g. conditions for SDT being fulfilled in RRC may not necessarily trigger the SDT to be considered ongoing in MAC etc).

In order to keep the MAC spec self-contained and avoid cross dependencies between the spec, one option could be to define the SDT ongoing and CG-SDT ongoing labels within MAC explicitly. To do this, we should first understand when SDT/CG-SDT should be considered ongoing in MAC.

Rapporteur’s understanding is that from MAC perspective, for RA-SDT, SDT procedure is ongoing from the point when the RA procedure is initiated for SDT until SDT is terminated.

Similarly, CG-SDT is ongoing from the point when initial transmission for CG-SDT is performed until the SDT procedure is terminated.

Companies are invited to comment on the above understanding:

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| **Q7: Do companies agree that in MAC, for RA-SDT, the SDT procedure is ongoing from the point when the RA procedure is initiated for SDT until SDT is terminated?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes |  |
| LGE | No | We think both CG-SDT and RA-SDT should be considered as ongoing when CCCH message is transmitted, same as RRC.  The rapporteur’s suggestion has a problem in that the start time of SDT procedure is different between CG-SDT and RA-SDT. For RA-SDT, the time point of CCCH transmission is different from the RA procedure initiation.  Rapporteur: Yes, this is different, but, it seems this is how it is handled in MAC already anyway and minimises changes as noted below. |
| Huawei, HiSilicon | Yes | We think what the rapporteur proposes is OK. As pointed out by LGE, there will be some difference between RA-SDT and CG-SDT, but this does not seem to create any issues while the current MAC design seems to assume the procedure is ongoing already when RACH was triggered. Hence, the rapporteur’s proposal allows to avoid unnecessary changes. |
| ZTE | Yes | We don’t think that we need to align this across RRC and MAC. RRC has different conditions for when SDT is to be considered ongoing from RRC perspective. MAC can have MAC specific considerations. If we get rid of SDT ongoing labels from RRC anyway, we think we can try to clarify MAC on its own. |
| Intel | Maybe no but, see comment | SDT General section §5.27.1 uses the reference **“SDT procedure is initiated for MO-SDT” (or MT-SDT)** and there is currently no reference in MAC to ongoing RA-SDT procedure (apart than a reference in §5.4.6 (“All triggered PHRs shall be cancelled when there is an ongoing SDT procedure”)). Therefore, it is unclear if any clarification or change is needed in MAC for RA-SDT. Moreover, MAC already captures when MAC entity is configured with SDT and when SDT proc is initiated:  “**The MAC entity may be configured by RRC with SDT and the SDT procedure may be initiated by RRC layer for MO-SDT or MT-SDT**. The SDT procedure initiated for MO-SDT can be performed either by Random Access procedure with 2-step RA type or 4-step RA type (i.e., RA-SDT) or by configured grant Type 1 (i.e., CG-SDT). The SDT procedure initiated for MT-SDT can be performed either by Random Access procedure with 2-step RA type or 4-step RA type (i.e., RA-SDT is not applicable as specified in clause 5.1.1b) or by configured grant Type 1 (i.e., CG-SDT).”  Rapporteur: Sure, the intention is not to define RA-SDT ongoing/not ongoing, but just to define when SDT is considered ongoing. |
| Sharp | Yes |  |
| Qualcomm | Yes |  |
| MediaTek | Yes with comment | In MAC spec, it has its own conditions on SDT initiation. When the SDT procedure is initiated, it’s deemed ongoing as well. |
| CATT | May be not | We prefer that we have the same definition between MAC and RRC spec. Otherwise, this will cause some confusion. Besides, there seems no big issue if we define the RA-SDT ongoing when lower layer transmit the CCCH message. |
| **Summary:**   * Majority agree with the proposal. * One company points out that the definitions should be aligned between RRC and MAC. But, this may be not needed (especially if we agree with P4 above.   **Proposal 6: Clarify in MAC spec that for RA-SDT, the SDT procedure is ongoing from the point when the RA procedure is initiated for SDT until SDT is terminated (6/9)** | | |

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| **Q8: Do companies agree that in MAC, for CG-SDT, CG-SDT procedure is ongoing from the point when initial transmission for CG-SDT is performed until the SDT procedure is terminated?** | | |
| Company | Yes/No | Comment |
| Ericsson | Yes |  |
| LGE | Yes |  |
| Huawei, HiSilicon | Yes | See above |
| ZTE | Yes |  |
| Intel | Yes but, see comment | As explained in Q7, SDT General section §5.27.1 uses the reference “SDT procedure is initiated for MO-SDT” (or MT-SDT) and in general no changes seem needed due to the change currently discussed to RRC.  On other hand, MAC also captures the terminology “CG-SDT procedure is ongoing” in sections §5.1.4a (MSGB reception and contention resolution for 2-step RA type), §5.2 (Maintenance of Uplink Time Alignment) and §5.4.6 (All triggered PHRs shall be cancelled when there is an ongoing SDT procedure). In some of those related reference, it also refers to the CG-SDT triggered MAC §5.27.1. Maybe some clarification is needed in MAC on this, but we understand that this is independent to the change of the ongoing discussion for RRC. |
| Sharp | Yes |  |
| Qualcomm | Yes |  |
| MediaTek | Yes with comment | MAC can have its own conditions for what and when is the on-going CG-SDT procedure. |
| CATT | Yes but with comments | In order to avoid the misalignment between MAC and RRC spec, the definition of SDT ongoing should be aligned. Whether the time that when initial transmission for CG-SDT is performed means that the time that lower transmit the CCCH message? |
| **Summary:**   * Again, majority seem to agree with this, although some companies may still think there should be alignment between RRC and MAC. One company also thinks no changes are needed, but seems to agree with the intention of the proposal.   **Proposal 7: For CG-SDT, CG-SDT procedure is ongoing from the point when initial transmission for CG-SDT is performed until the SDT procedure is terminated (9/9)** | | |

If companies agree with the above understanding, it can be clarified in the following way:

|  |
| --- |
| 5.27 Small Data Transmission  5.27.1 General  …  If Random Access procedure is selected above for SDT procedure initiated for MO-SDT or MT-SDT, the MAC entity considers that SDT procedure is ongoing and after the Random Access procedure is successfully completed (see clause 5.1.6), the UE monitors PDCCH addressed to C-RNTI received in random access response until the SDT procedure is terminated. If CG-SDT is selected above after the initial transmission for CG-SDT is performed, the MAC entity considers that CG-SDT procedure is ongoing and the UE monitors PDCCH addressed to C-RNTI as stored in UE Inactive AS context as specified in TS 38.331 [5] and CS-RNTI until the SDT procedure is terminated. |

Companies can comment on the above change and provide any other alternatives.

|  |  |  |
| --- | --- | --- |
| **Q9: Do companies agree with the above clarification in MAC?** | | |
| Company | Yes/No | Comment (please provide any alternative ways of clarifying this in MAC) |
| Ericsson | Yes | It will also be easier to read MAC/RRC spec if the label “SDT procedure is ongoing” is not used in both specifications with slightly different meaning. Thus this further strengthens the argument to use “while T319a is running” in RRC spec. |
| LGE | No | As mentioned in Q7, we think both CG-SDT and RA-SDT should be considered as ongoing when CCCH message is transmitted. This can be specified with general text. |
| Huawei, HiSilicon | Yes | We support having this clarification. |
| ZTE | Yes |  |
| Intel | No | These changes are not needed for current discussion as explained in the responses to Q7/Q8. On other hand, some change may be helpful for the CG-SDT part this or a different one. |
| Sharp | Yes |  |
| Qualcomm | - | But we think no change is needed. The current spec is clear. |
| MediaTek | Yes | We’re fine with the above proposal to have a clear definition of “SDT is ongoing” since we had referred to it in section 5.4.1. We also suggest unifying all the wordings “on-going” and “ongoing” throughout MAC spec (now they both are used and not aligned in all places). |
| CATT | No | Same view as LGE. |
| **Summary:**   * The overall view is a bit split, but we can attempt to clarify this according to the majority preference. Rapporteur will provide a MAC CR for discussion per above.   **Proposal 8: Discuss and agree the MAC CR in XXXX.** | | |

Finally, we can check if there are any other clarifications needed in MAC.

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| --- | --- | --- |
| **Q10: For the purpose of SDT / CG-SDT ongoing/not ongoing checks in MAC, are there any other clarifications/improvements needed in MAC?** | | |
| Company | Yes/No | Comment |
| Ericsson | No | Not if RRC mentions T319a only. |
| LGE | Yes | We think same clarification may be specified for both RRC and MAC for better understanding. |
| Huawei, HiSilicon | Seems not |  |
| ZTE | May be nothing else |  |
| Intel | Maybe | As explained in above comment, if any updated is needed for CG-SDT, this seems independent to current discussion; Rapp’s suggestion might be sufficient. |
| MediaTek | See comment | If MAC and RRC have separate definitions for “SDT is ongoing”, it would be good to clearly capture this e.g., in a NOTE in MAC spec. |
| CATT | May be not |  |
| Qualcomm | - | Maybe some clarification is helpful cross RRC and MAC about ‘SDT is ongoing’ which is different within each spec. But change the UE behaviour in T1 as T0 in RRC is not supported. |
| **Summary:**   * There is no further critical issue identified by companies apart from the possible clarification in MAC per P7 above although some companies felt that some clarification may be useful. Seems there is no critical issue, so, no further proposal seems needed. | | |

# Conclusion

The following proposals are made:

**For RRC spec:**

**Proposal 1: Clarify that “The UE in RRC\_INACTIVE state while T319a is running ~~SDT procedure is ongoing~~, is only required to acquire broadcasted *SIB1* and *MIB* if the UE can acquire them without disrupting unicast data reception, i.e. the broadcast and unicast beams are quasi co-located.” – Apart from this the UE behaviour in RRC as specified currently is clear.**

**Proposal 2: Discuss whether we can specify option A – i.e. Consider SDT as ongoing at the same time as T319a start (7/9)**

**Proposal 3: Discuss whether we can align the UE behaviour in T1 (i.e. whilst waiting for CCCH message to be transmitted by lower layers) to the behaviour in T0 (before initiating SDT) – (7/8)**

**Proposal 4: If P2 and P3 are agreed, then attempt to clean-up RRC spec such that we rely on T319a running or not and get rid of SDT ongoing/not ongoing labels (may be acceptable to 7/9)**

**Proposal 5: If P2 and P3 are not agreed, then attempt to clarify when SDT is considered ongoing (e.g. in definitions section)**

**For MAC spec:**

**Proposal 6: Clarify in MAC spec that for RA-SDT, the SDT procedure is ongoing from the point when the RA procedure is initiated for SDT until SDT is terminated (6/9)**

**Proposal 7: For CG-SDT, CG-SDT procedure is ongoing from the point when initial transmission for CG-SDT is performed until the SDT procedure is terminated (9/9)**

**Proposal 8: Discuss and agree the MAC CR in XXXX.**

# References

1. [R2-2400585](file:///C:/evutukuri/work/5G/RAN2/docs/R2-2400585.zip) Small Data Transmissions Control Plane Ericsson RAN2#125