3GPP TSG-RAN WG2 Meeting #121 R2-23xxxxx

Athens,Greece, Feb 27th – Mar 3rd , 2023

**Agenda item: 6.7.4**

**Source: ZTE Corporation**

**Title:**  **[AT121][404][POS] TAT timers in RRC\_INACTIVE (ZTE)**

**WID/SID: NR\_pos\_enh-Core**

**Document for: Discussion and Agreement**

# 1 Introduction

This document is to kick off the following email discussion:

* [AT121][404][POS] TAT timers in RRC\_INACTIVE (ZTE)

 Scope: Discuss the CR in R2-2300935 and converge on a consensus version of the agreeable parts.

 Intended outcome: Agreeable CR

 Deadline: Wednesday 2023-03-01 1900 EET

# 2 Contact Information

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| OPPO | Liu yang (liuyangbj@oppo.com) |
| Huawei, HiSIlicon | Yinghao Guo (yinghaoguo@huawei.com) |
| Samsung | Taeseop Lee (taeseop.lee@samsung.com) |
| LG | Jonggil Nam (jonggil.nam@lge.com) |
| vivo | Xiang Pan (panxiang@vivo.com) |
| Xiaomi | Xiaolong Li (lixiaolong1@xiaomi.com) |
| ZTE | Yu Pan(pan.yu24@zte.com.cn) |
| Ericsson | Ritesh.shreevastav@ericsson.com |
| CATT | lijianxiang@catt.cn |
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# 3 References

1. [R2-2300936](file:///C%3A%5C%5CUsers%5C%5Cmtk16923%5C%5CDocuments%5C%5C3GPP%20Meetings%5C%5C202302-03%20-%20RAN2_121%2C%20Athens%5C%5CExtracts%5C%5CR2-2300936%20Correction%20to%20MAC%20spec%20for%20positioning.doc%22%20%5Co%20%22C%3AUsersmtk16923Documents3GPP%20Meetings202302-03%20-%20RAN2_121%2C%20AthensExtractsR2-2300936%20Correction%20to%20MAC%20spec%20for%20positioning.doc) Correction to MAC spec for positioning ZTE Corporation CR Rel-17 38.321 17.3.0 1536 - F NR\_pos\_enh-Core

# Discussion

## 4.1. First change in R2-2300936

In [1], the contribution provides MAC changes on TA maintenance in RRC\_INACTIVE. The first change is that:

In spec 38.321 section 5.2, the MAC entity shall not perform any uplink transmission except the RA Preamble and MSGA transmission for a Serving Cell only when the timeAlignmentTimer is not running and CG-SDT procedure is not ongoing and SRS transmission in RRC\_INACTIVE is not on-going. Therefore, the legacy wording ‘or’ should be changed to ‘and’.

The proposed change is as below:

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| The MAC entity shall not perform any uplink transmission on a Serving Cell except the Random Access Preamble and MSGA transmission when the *timeAlignmentTimer* associated with the TAG to which this Serving Cell belongs is not running, CG-SDT procedure is not ongoing and SRS transmission in RRC\_INACTIVE as in clause 5.26 is not on-going. |

Companies are invited to provide comments on this change.

**Q1: Do you agree with the change above？**

|  |  |  |
| --- | --- | --- |
| Company |  Yes/ No | Comments |
| OPPO | OK | The UE uplink transmission condition could be reasonably relexed |
| Huawei, HiSilicon | OK |  |
| Samsung | OK  | Essential correction. |
| LG | OK, but | Agree with the change, but we see multiple statements on UL transmission depending on conditions of TAT, CG-SDT and SRS timers in chapter 5.2 in TS 38.321 as below;

|  |
| --- |
| The MAC entity shall not perform any uplink transmission on a Serving Cell except the Random Access Preamble and MSGA transmission when the *timeAlignmentTimer* associated with the TAG to which this Serving Cell belongs is not running, CG-SDT procedure is not ongoing or SRS transmission in RRC\_INACTIVE as in clause 5.26 is not on-going. Furthermore, when the *timeAlignmentTimer* associated with the PTAG is not running, CG-SDT procedure is not ongoing and SRS transmission in RRC\_INACTIVE as in clause 5.26 is not ongoing, the MAC entity shall not perform any uplink transmission on any Serving Cell except the Random Access Preamble and MSGA transmission on the SpCell. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when the *cg-SDT-TimeAlignmentTimer* is not running during the ongoing CG-SDT procedure as triggered in clause 5.27. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when *inactivePosSRS-TimeAlignmentTimer* is not running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26. |

We think simpler and integrated sentence can be also considered for easy understanding if needed. Anyway, at this time, we agree the change. |
| vivo | OK |  |
| Xiaomi | OK |  |
| ZTE | OK |  |
| Ericsson | Needs more Simplification | Better to rephrase as *if none of the below timers are running*:* TAT,
* CG-SDT Timer
* SRS Inactive Timer
 |
| CATT |  | The key point of this sentence is not to describe under what situations the UE cannot perform uplink transmission. The logic should be, before the SDT and INACTIVE positioning were introduced, UE cannot perform UL transmission when *timeAlignmentTimer* is not running, but after introducing the SDT and INACTIVE positioning, UE can perform some UL transmission even the *timeAlignmentTimer* is not running.Hence, we propose the following modifications.The MAC entity shall not perform any uplink transmission on a Serving Cell except the Random Access Preamble and MSGA transmission when the *timeAlignmentTimer* associated with the TAG to which this Serving Cell belongs is not running, unless the CG-SDT procedure is ongoing or SRS transmission in RRC\_INACTIVE as in clause 5.26 is on-going.By this way, we try to keep the meaning of this sentence, but not just only make the sentence correct. |

## 4.2. Second change in R2-2300936

In current MAC spec, the description of MAC behaviour when CG SDT timer and pos SRS timer are introduced is as follows:

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| --- |
| The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when the cg-SDT-TimeAlignmentTimer is not running during the ongoing CG-SDT procedure as triggered in clause 5.27. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when inactivePosSRS-TimeAlignmentTimer is not running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26. |

However, the condition of ‘The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission’ should take both SRS TA timer and CG SDT timer into consideration. To be specific, SRS transmission in RRC\_INACTIVE should be considered during the CG-SDT procedure, in the meanwhile, CG-SDT transmission should be considered during the SRS transmission in RRC\_INACTIVE procedure.

According to the discussion, companies are generally fine with the intention but think wordings can be reshaped. Therefore two options of change are proposed towards the issue:

**Option 1:**

|  |
| --- |
| The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when the *cg-SDT-TimeAlignmentTimer* is not running during the ongoing CG-SDT procedure as triggered in clause 5.27 and the *inactivePosSRS-TimeAlignmentTimer* is not running. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when *inactivePosSRS-TimeAlignmentTimer* is not running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26 and the *cg-SDT-TimeAlignmentTimer* is not running. |

Option 1 is the legacy CR wording. Option 1 specifies the MAC behaviour when both positioning SRS timer and SDT timer are not running during the ongoing CG-SDT procedure, and specifies the MAC behaviour when both positioning SRS timer and SDT timer are not running during the procedure for SRS transmission in RRC\_INACTIVE.

**Option 2:**

|  |
| --- |
| The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission when the *cg-SDT-TimeAlignmentTimer* is not running during the ongoing CG-SDT procedure as triggered in clause 5.27 and the *inactivePosSRS-TimeAlignmentTimer* is not running.  |

Option 2 specifies the MAC behaviour when both positioning SRS timer and SDT timer are not running during the ongoing CG-SDT procedure.

From the rapporteur point of view, option 1 is a complete description of UE behaviour by separating SDT procedure and SRS transmission in RRC\_INACTIVE procedure as below:

During the ongoing CG-SDT procedure as triggered in clause 5.27:

|  |  |  |
| --- | --- | --- |
|  | Pos timer going | pos timer not going |
| SDT timer going |  |  |
| SDT timer not going |  | The MAC entity shall not perform ... |

During the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26:

|  |  |  |
| --- | --- | --- |
|  | Pos timer going | pos timer not going |
| SDT timer going |  |  |
| SDT timer not going |  | The MAC entity shall not perform ... |

While option 2 is a simpler formulation but does not cover the case for ‘during the procedure for SRS transmission in RRC\_INACTIVE’. Companies are invited to provide views on the preferred option.

**Q2: Which option (option 1 or option 2) do you prefer on the change?**

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| --- | --- | --- |
| Company |  Option1/option2/none | Comments |
| OPPO | Option 2 | We think that we should exclude the case of the TAT being expired from the ‘timer is not running’ situation, as the SRS resource or the CG-SDT configured grants will be either released or cleared, according to TS 38.321:1> when the *inactivePosSRS-TimeAlignmentTimer* expires:2> notify RRC to release Positioning SRS for RRC\_INACTIVE configuration(s). AND 1> when the *cg-SDT-TimeAlignmentTimer* expires:2> clear any configured uplink grants;2> if a PDCCH addressed to the MAC entity's C-RNTI after initial transmission for the CG-SDT with CCCH message has not been received:3> consider ongoing CG-SDT procedure as terminated;3> indicate the expiry of *cg-SDT-TimeAlignmentTimer* to the upper layer.in such cases, it seems unnecessary to let the UE still capable of performing UL transmission even if there exist another TAT timer is still running. On the other hand, we can also find that according to the TS 38.321, when the *cg-SDT-TimeAlignmentTimer* expires, ongoing CG-SDT procedure will be terminated. Since the CR given by ZTE explicitly specifies the status is ‘during the ongoing CG-SDT procedure’ which in turn implies that *cg-SDT-TimeAlignmentTimer* is not expired, so the timer expiration case could be excluded from the ‘timer not running’ meaning and as a result leads to a valid CR. |
| Huawei, HiSilicon[Updated] | Option2 | With further thinking, we are also OK with Option2 |
| Samsung | Option2  | For PosSRS case, when *inactivePosSRS-TimeAlignmentTimer* expires*,* the UE always releases the SRS configuration. So if there is ongoing PosSRS transmission, *inactivePosSRS-TimeAlignmentTimer* is always running*.* Thus, we don’t need to consider the case “*inactivePosSRS-TimeAlignmentTimer* is not running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26.”. We can just remove the second sentence here.For CG-SDT case, there can be the case that the UE keeps the ongoing CG-SDT procedure even when *cg-SDT-TimeAlignmentTimer* expires. Thus, we can keep the first sentence and modify it to clarify that UE needs to check both *inactivePosSRS-TimeAlignmentTimer and cg-SDT-TimeAlignmentTimer.* |
| LG | None | Agree with intension, but we think it is not necessary. Each sentence dose not allow UL transmission except RA and MSGA messages for each case, which means each condition should be checked independently when UL transmission, so nothing broken. |
| vivo | Remove these two sentences or Option 2 | The motivation is to restrict the UL transmission other than the SDT and SRS transmission. We think the restriction in Q1 is enough. And the TAT criteria for SDT and SRS transmission are feature specific and have been captured in the corresponding sections.However, as the first sentence is related to SDT, if we would maintain it, then Option 2 is preferred. |
| Xiaomi | None | In our understanding, the current specification is not wrong and UE should check both inactivePosSRS-TimeAlignmentTimer and cg-SDT-TimeAlignmentTimer according to the current specification.  |
| ZTE | Option 2 | After further checking we think the last sentence is not needed. When we say timer is not going, there are two cases: timer stops, or timer expires.If timer expires, SRS configuration will be released, then UE will not ‘during the procedure for SRS transmission in RRC\_INACTIVE’;If timer stops as indicated by RRC layer (when receiving RRC Resume/RRC Setup, or cell reselection occurs), the SRS configuration will also be released, then UE will not ‘during the procedure for SRS transmission in RRC\_INACTIVE’. |
| Ericsson | Option 1 | Agree with Huawei; they can run in parallel/independently. Though some more polishing is needed for Option 1. |
| CATT | None | Similar as our comment in Q1. We propose the following modifications:The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission unless the *cg-SDT-TimeAlignmentTimer* is running during the ongoing CG-SDT procedure as triggered in clause 5.27 or *inactivePosSRS-TimeAlignmentTimer* is running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26. |

 **Q3: If your answer to Q2 is none, please provide your proposed change.**

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| --- | --- |
| Company | Comments |
| CATT | Similar as our comment in Q1. We propose the following modifications:The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission unless the *cg-SDT-TimeAlignmentTimer* is running during the ongoing CG-SDT procedure as triggered in clause 5.27 or *inactivePosSRS-TimeAlignmentTimer* is running during the procedure for SRS transmission in RRC\_INACTIVE as in clause 5.26. |
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# 5 Conclusion

**To be added**