3GPP TSG-RAN WG3 #116-e R3-223697

May. 9~19, 2022

**Online**

**Agenda item: 9.1.9.1 (Corrections)**

**Source: Samsung (moderator)**

**Title: Summary of offline discussion on CB: # SDT2\_CGbased**

**Document for: Approval**

# Introduction

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| **CB: # SDT2\_CGbased**  **- For CG-SDT, gNB-DU or gNB-CU-UP shall buffer the SDT UL data/NAS PDU?**  **- Add the gNB-CU UE F1AP ID IE in the old CG-SDT Session Info IE?**  **- Add an optional ‘SDT’ Indicator Setup’ in the SRB to Be Setup List IE?**  **- Introduce the SDT Termination Request IE to indicate the reason of request for termination of the ongoing SDT in F1AP UE INACTIVITY NOTIFICATION message?**  **- Add indication on SDT for UL RRC MESSAGE TRANSFER message including RRCResumeRequest message?**  **- Check details of other corrections**  **- Capture agreements and provide CRs if agreeable**  (Samsung - moderator)  Summary of offline disc [R3-223697](file:///D:\3GPPmeeting\202205%20RAN3%20116e\TSGR3_116-e\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Inbox\R3-223697.zip) |

The following contribution is also considered in this CB since it addresses CG-SDT related issues.

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| [R3-223070](file:///D:\3GPPmeeting\202205%20RAN3%20116e\TSGR3_116-e\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223070.zip) | Correction on RACH based SDT and CG based SDT (Huawei, China Telecom, China Unicom, ZTE) | CR0201r, TS 38.401 v17.0.0, Rel-17, Cat. F |

This e-mail discussion is divided into two phases:

* Phase I: View collection

Deadline: Friday, May. 13th, 2022, 08:00 UTC.

* Phase II:

Deadline: TBD

# For the Chairman’s Notes (Phase I)

# Discussions

## Stage-2 issues

Issue 1: **Buffering of CG-SDT data**

**Opt1: Buffering at gNB-DU till receiving new indicator (e.g., verification pass information)**

**Opt2: Buffering at gNB-CU-UP till receiving resume indication from gNB-CU-CP. (stage-2 impact only)**

[3][4](Ericsson), [5](Nokia)

**Opt3: Buffering at gNB-DU till receiving UE CONTEXT MODIFICATION REQUEST message (stage-2 impact only)**

[14] (Huawei, China Telecom, China Unicom, ZTE)

**Opt4: configurable gNB-DU buffering**, i.e., whether buffering CG-SDT data at gNB-DU or not depends on gNB-CU-CP’s configuration. If the CG-SDT data is buffered at the gNB-DU, the data can be sent only when receiving indication from gNB-CU-CP.

[1][2](ZTE, China Telecom)

**Opt5**: **buffering SDT data at gNB-DU as the implementation issue by mandating the UE Context Modification procedure (stage-2 impact only),** i.e., after receiving RRCResumeRequest message, the gNB-CU-CP should send the UE CONTEXT MODIFICATION message to the gNB-DU to restart the transmission of gNB-DU by existing Transmission Action Indicator IE. This step is needed since the gNB-DU has stop all the air interface transmission after sending the UE to INACTIVE. Then, a restart indication is needed to restart the Uu transmission. By mandating the UE CONTEXT MODIFICATION procedure after receiving RRCResumeRequest message, the SDT buffering at gNB-DU becomes an implementation issue.

[11] (Samsung)

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The moderator has the following observations:

* Majority companies (5) proposes stage-2 impact to support gNB-DU buffering as the solution, and two companies proposes to have gNB-CU-UP with stage-2 impact only. While Opt1&Opt4 have stage-3 impact. Thus, a common ground among companies seem to be only have stage-2 impact w.r.t. this issue, and the candidate can be Opt 2, Opt3 and Opt 5. Moreover, Opt 5 can be considered as middle ground between Op2 and Opt3.
* In Opt 3 and Opt 5, one additional issue is raised, i.e., whether UE Context Modification procedure should be triggered during CG-SDT procedure. [14] considered this procedure as the verification of resume UE, while [11] proposed to use this procedure to restart the gNB-DU transmission over air interface.

To make progress, the moderator proposes to find a compromising way for both gNB-DU buffering and gNB-CU-UP buffering in the way only impacting stage-2, e.g., Opt 5. However, before that, the group needs discuss the following issue, i.e., whether UE Context Modification procedure should be triggered when gNB-CU-CP receives the RRCResumeRequest message in CG-SDT? Then, the group can make a choice among Opt2, Opt3 and Opt5. Therefore, the moderator list two questions as below:

##### **Q1: should UE Context Modification procedure be triggered when gNB-CU-CP receives the RRCResumeRequest message in CG-SDT?**

##### **Q2: Is a compromised solution (e.g., Opt 5 or other new option) acceptable? If not, which option among {Opt2, Opt3} is preferred?**

(Moderator notes: if the progress is desirable, a possible compromise among companies may be needed.)

|  |  |
| --- | --- |
| Company | Comments |
| Samsung | **Q1: yes.**  This procedure informs DU two things: 1) verify the RRCResumeRequst from the UE is accepted by gNB-CU-CP; and 2) inform gNB-DU can start air interface transmission for INACTIVE UE. The UE CONTEXT MODIFICATION REQUEST message can contain Transmission Action Indicator IE by setting to “restart”.  **Q2: Opt5 is acceptable for us.**  Opt5 allows the gNB-DU buffering and the gNB-CU-UP buffering being an implementation issue. |
| ZTE | Q1: Yes.  Q2: We support a compromised solution, to push the progress. |
| CATT | Q1: Yes, after UE context verification in gNB-CU-CP, the F1AP UE context modification procedure is needed.  Q2, I the answer to Q1 is Yes, we also support option 5 as a compromised way. |
| Google | It is preferred to have Opt2: Buffering at gNB-CU-UP till receiving resume indication from gNB-CU-CP. |
| Nokia | No and No.  We think that not all aspects of the problem have been presented by the moderator. Not only the specification impact should be considered by the signalling impact in order to make any serious comparison. All solutions with DU buffering add 2 messages at every SDT transaction compared to CU UP buffering which is a severe impact.  Also, about company positions, Intel and Google also support option 2 which makes 4 companies.  Our suggestion on this issue which is the key remaining one on SDT, is to treat it online with discussion and show of hands, as normal 3GPP rules in case of strong controversy. |
| China telecom | Q1: Yes.  Q2: No. we support option3. In our understanding, PDCP entity in suspend status could not receive/buffer any new data from UE. |
| Huawei | Q1: yes, the modification procedure should be triggered only if the UE is successfully verified.  Q2: we prefer option 3, it is simpler and straightforward.  For option5, in case both buffering at DU and UP are allowed, then in case the data is buffered at UP side, the modification procedure will be useless, note that currently the *Transmission Action Indicator* IE is used to indicate indicates actions for the gNB-DU for the data transmission to the UE (see 9.3.1.11 38473), not the data transmission towards the CU-UP. |

**Summary**

Issue 2: **SRB0 in UL RRC MESSAGE TRANSFER**

[11](Samsung) and [12](Samsung, ZTE) indicate that “During CG-SDT, the UL RRC MESSAGE TRANSFER message will be used to convey the RRCResumeRequest message, which is the only case for sending SRB0 message via UL RRC MESSAGE TRANSFER message. Therefore, gNB-CU can identify this resume procedure is for SDT so that it can tirgger E1 procedure to resume SDT”. Then, the stage-2&stage-3 text are provided as below, respectively:

- stage-2: “10. The gNB-DU sends the UL RRC MESSAGE TRANSFER message including the *RRCResumeRequest* message to indicate the access due to CG-SDT.”

- stage-3: “If the *RRC container* IE contains *RRCResumeRequest* message, the gNB-CU shall, if supported, consider the resume procedure for CG-SDT.”

##### **Q3: Is it agreeable to add the above stage-2/3 clarification in case of SRB0 in UL RRC MESSAGE TRANSFER message？**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes | SRB0 in UL RRC MESSAGE TRANSFER message is a unique case for CG-SDT. It is beneficial to have such clarification. |
| ZTE | Yes | Share the same view with Samsung |
| CATT | Yes | Fine to have this clarification. |
| Google | OK |  |
| Nokia | OK |  |
| China Teleocm | Yes |  |
| Huawei | Yes |  |

**Summary**

## Stage-3 issues

Issue 3: **CG-SDT Session Info (F1AP) update**

[6] (ZTE, Ericsson, China Telecom, CATT, Huawei, Samsung) proposed to add the following IE in CG-SDT Session Information IE since theUE-associated logical F1-connection is identified by two IDs.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  |
| gNB-DU UE F1AP ID | M |  | 9.3.1.5 |  |

Issue 4: **SDT indicator to SRB**

[7] (Lenovo, ZTE, Huawei, CATT, Nokia, Nokia Shanghai Bell, Ericsson, Samsung) proposed to

“To support SDT SRB, in the UE CONTEXT MODIFICATION REQUEST message:

* add an optional ‘SDT’ Indicator Setup’ in the *SRB to Be Setup List* IE;”

Issue 5: **SDT termination request in F1**

[8] (Lenovo, Nokia, Nokia Shanghai Bell, ZTE, Samsung, Ericsson) proposed to “Introduce the *SDT Termination Request* IE to indicate the reason of request for termination of the ongoing SDT in F1AP UE INACTIVITY NOTIFICATION message”

Considering several companies are aligned well w.r.t. solution to the above three issues, the moderator raises the the following potential proposal for view collection.

*Potential proposal 1: agree the following changes for F1AP:*

* *1a: add gNB-CU UE F1AP ID in CG-SDT Session Info IE.*
* *1b:add an optional ‘SDT’ Indicator Setup’ IE in the SRB to Be Setup List IE in UE CONTEXT MODIFICATION REQUEST message*
* *1c: add the SDT Termination Request IE in F1AP UE INACTIVITY NOTIFICATION message*

##### **Q4: Is above Potential proposal 1 agreeable?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes |  |
| ZTE | Yes |  |
| CATT | Yes |  |
| Google | Yes |  |
| Nokia | Yes |  |
| China Telecom | yes |  |
| Huawei | Yes |  |

**Summary**

Issue 6: **RAN2 alignment**

[9](Intel), [10](Google), [12](Samsung), and [13] (Samsung) proposed to change SDT-MACPHY-Config IE to SDT-CG-Config IE to align with RAN2 spec.

##### **Q5: Do you agree with the above alignment with RAN2:**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung | Yes |  |
| ZTE | Yes |  |
| CATT | Yes |  |
| Google | Yes | “SDT-MAC-PHY-CG-Config” should be referred to in TS 38.331 instead of “SDT-CG-Config”. |
| Nokia | Yes |  |
| China telecom | yes |  |
| Huawei | Yes |  |

**Summary**

Issue 7: **SDT CG configuration from CU to DU**

[10](Google) claimed as follows:

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| * RAN2#117-e agreed that   + “When CG-TAT expires, MAC shall release the CG resources. RRC keeps the CG configuration (for delta signalling).”   + ”Delta signalling is based on the previous SDT configuration (i.e. only applicable to SDT operation and will be released when the UE moves to connected and hence delta configuration based on connected mode CG configuration is not supported). FFS other details.”   Therefore, if CG-SDT has been configured to the UE before and the UE remains in Inactive, the SDT-MACPHY-Config may be included in the CU to DU RRC Information (e.g., when CG-TAT expired or UE context is relocated) and signalled to the gNB-DU for SDT procedure to support delta configuration. |

So, [7] proposed to add SDT CG configuration in the CU to DU RRC Information.

##### **Q6: Is it agreeable to add SDT CG configuration in CU to DU RRC Information IE？**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Samsung |  | Try to understand the scenario:   * For UE context relocation case, does it mean the new serving gNB-CU should send the CG configuration of old serving gNB to new serving gNB-DU for delta configuration? If so, such enhancement may be needed. A further concern is whether XnAP enhancement is needed to transfer CG configuration from old serving gNB to new serving gNB during context relocation? * For CG-TAT expired, how does gNB-CU know the expiry? This case may not need such enhancement.   In summary, such enhancement for UE context relocation case may be needed. The XnAP enhancement needs checking |
| ZTE | Not agree | In RAN2, if UE stores RRC config, it is benefit to have delta configuration to save Uu signaling.  But, the DU may be changed and the old CG resource may be expired, as indicated by Samsung. So this enhancement is not needed. |
| CATT |  | Just as Samsung said, the scenario(s) should be further clarified. |
| Google | Yes | Answering the scenario questions  - The receiving gNB should have the SDT-Config to support delta configuration and there will be related discussion in RAN2 for the inter-node message  - It was agreed in the last meeting “When the TAT-SDT expires, the gNB-DU initiates the UE Context Release Request procedure, including a new Cause value.” Therefore, the gNB-CU may need to provide the SDT-MACPHY-Config to the gNB-DU to support delta configuration. |
| Nokia | NOK | Scenario still unclear. |
| China Telecom | No | Scenario will be clarified. |
| Huawei | FFS, wait for RAN2. | We think the information is needed to be known by the DU, and there are two possibilities, one is to add in RAN3 IE level, another is like Gg mentions it can be added in the RRC inter node container, therefore, we prefer to wait for RAN2 progress. |

**Summary**

## Others

There are some other editorial correction for stage-2 and stage-3. Those aspects can be addressed via CR checking in Phase-II. If other critical issues are missing above, please indicate below.

##### **Q7: Please indicate the other CG-SDT related issues not addressed above**

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| --- | --- |
| Company | Comments |
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# Conclusion, Recommendations [if needed]

If needed

# References

[1] [R3-223109](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223109.zip) Discussion on how to buffer the CG-SDT data (ZTE. China Telecm)

[2] [R3-223110](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223110.zip) The method on how to buffer the CG-SDT data (ZTE. China Telecm)

[3] [R3-223353](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223353.zip) Analysis of the buffering options for CG-SDT (Ericsson)

[4] [R3-223354](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223354.zip) Description of CG-SDT buffering in NG-RAN (Ericsson)

[5] [R3-223153](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223153.zip) Correction of CG-based SDT stage 2 (Nokia, Nokia Shanghai Bell)

[6] [R3-223112](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223112.zip) Correction on CG based SDT (ZTE, Ericsson, China Telecom, CATT, Huawei,Samsung)

[7] [R3-223305](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223305.zip) Correction on SRB SDT indication (Lenovo, ZTE, Huawei, CATT, Nokia, Nokia Shanghai Bell, Ericsson, Samsung)

[8] [R3-223306](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223306.zip) Correction on SDT termination request in F1 (Lenovo, Nokia, Nokia Shanghai Bell, ZTE, Samsung, Ericsson)

[9] [R3-223502](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223502.zip) ASN.1 Correction for Rel-17 CG-SDT on SDT-CG-Config container (Intel Corporation)

[10] [R3-223247](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223247.zip) Correction to SDT for supporting delta signaling (Google Inc.)

[11] [R3-223543](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223543.zip) Correction on Rel-17 SDT (stage-2) (Samsung)

[12] [R3-223544](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223544.zip) Correction on Rel-17 SDT (F1AP) (Samsung,ZTE)

[13] [R3-223170](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223170.zip) SDT corrections over F1 (Ericsson)

[14] [R3-223070](file:///D:\Work\3GPP\RAN3\RAN3%23116e(202205)\Inbox\Drafts\CB%20%23%20SDT2_CGbased\Docs\R3-223070.zip) Correction on RACH based SDT and CG based SDT (Huawei, China Telecom, China Unicom, ZTE)