3GPP TSG-RAN WG3 #114bis-e R3-221086

Online, 17 – 26 January, 2022

**Agenda item: 24.4**

**Source: CATT (moderator)**

**Title: Summary of offline discussion on CB: # SDT4\_Others**

**Document for: Approval**

# Introduction

This contribution provides the summary for the following offline discussion:

**CB: # SDT4\_Others**

**- How to handle non-SDT data during SDT procedure?**

**- How to select CCCH solution/DCCH solution? Waiting for RAN2 progress or sending LS to RAN2?**

**- How to handle ROHC continuity in** [**R3-220103**](file:///D%3A%5C3GPPmeeting%5C202201%20RAN3%20114bis%20e%5CTSGR3_114bis-e%5CInbox%5CDrafts%5CCB%20%23%20SDT4_Others%5CInbox%5CR3-220103.zip)

**- Common issues for both RA-SDT and CG-SDT**

**- Capture agreements and open issues, provide TPs if agreeable**

(CATT - moderator)

Summary of offline disc [R3-221086](file:///D%3A%5C3GPPmeeting%5C202201%20RAN3%20114bis%20e%5CTSGR3_114bis-e%5CInbox%5CDrafts%5CCB%20%23%20SDT4_Others%5CInbox%5CR3-221086.zip)

For the Phase-I discussion, you’re kindly requested to provide your comments before **0:00 UTC Friday, January 21.**

Base on the outcome of the phase I, phase II may be needed to further discuss the content of the draft LS and the TP.

# For the Chairman’s Notes

Please capture the following proposals in the chairman notes for agreement:

**To be updated later.**

# Discussions (Phase-I)

## On ROHC continuity

In the LS from RAN2 [1], RAN2 agreed that the ROHC continuity function for SDT DRB can be configured as applicable for either the same cell where the RRC connection was suspended or the whole RNA.

|  |  |
| --- | --- |
| Overall descriptionIn RAN2#116-e, RAN2 discussed ROHC continuity function for SDT DRB, which requires the PDCP entities in the UE and network to continue the ROHC header compression protocol for SDT DRB (i.e. keep the ROHC context) in different SDT procedures. RAN2 agreed that the ROHC continuity function for SDT DRB can be configured as applicable for either the same cell where the RRC connection was suspended or the whole RNA. The relevant agreement was made as follows,

|  |
| --- |
| **Agreement:**For SDT, ROHC continuity functionality can be configurable between the cell and RNA. Send LS to RAN3 |

Actions**To RAN3****ACTION:** RAN2 respectfully asks RAN3 to take the above information into account when discussing the support of SDT.  |

In the contribution [2], RAN3 impact is analyzed and the following assumptions are provided:

* No RAN3 impact is foreseen to support the cell based ROHC continuity for SDT DRB.
* No RAN3 impact is foreseen to support the RNA based ROHC continuity for SDT DRB, in case the UE initiates SDT in the cell under the anchor gNB, or the UE initiates SDT in the cell out of RNA.
* In case in case RNA based ROHC continuity is configured, if the UE initiates the SDT in the new cell under the new serving gNB within the RNA, the last serving gNB should make decision to use without anchor relocation.

In the contribution [7][8][9], it’s proposed to add a new IE to indicate the ROHC continuity in E1AP BEARER CONTEXT MODIFICATION REQUEST message.

#### Q1: Do you agree to add a new IE to indicate the ROHC continuity in the E1AP BEARER CONTEXT MODIFICATION REQUEST message?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | Seems useful to indicate the CU-UP whether ROCH continuity should be applied for the UE. |
| ZTE | Yes | It is needed according to the LSin. |
| Intel Corporation | Yes | We are fine to add new IE for ROHC continuity, but we prefer to add into *DRB To Modify List* of 9.3.3.11 *PDU Session Resource To Modify List*.  |
| Huawei | No | We wonder if it is ok to reuse the legacy *Continue ROHC* IE in the *PDCP Configuration* IE-> *ROHC Parameters*, which is per DRB configuration.

|  |  |  |  |
| --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **IE type and reference** | **Semantics description** |
| **Choice ROHC Parameters** | M |  |  For more information see *PDCP-Config IE* in TS 38.331 [10]. |
| >ROHC |  |  |  |
| **…** |  |  |  |
| >>Continue ROHC | O | ENUMERATED(true, …) | See description of drb-ContinueROHC inTS 38.331 [10] |

 |
| China Telecom | yes | According to the LS from RAN2, this new IE is needed |
| LGE | Yes | Based on RAN2 LS, a new IE is needed |
| Lenovo, Motorola Mobility | No | Same view with Huawei.  |
| Google | No | Not sure if the “Continue ROHC” IE should be included here. Should not it be like non-SDT bearers? (A similar question Q7 is also in CB# SDT3\_CGbased.) |
| Qualcomm | Need further disc | Have the same thought as Huawei. Do we need anything here that is specific to SDT? Assuming also no relocation. |
| Samsung  | Yes  | Detailed signaling design can be considered together with the resume of SDT bearers |
| Nokia | OK | In principle OK but need to discuss the IE. |

Except the potential E1 impact as above, do you see any other RAN3 impact to support the cell-based and RNA-based ROHC continuity?

#### Q2: Do you see any other RAN3 impact (except the E1 part) to support the cell-based and RNA-based ROHC continuity?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | No, if any stage 2 impact should be considered. | We agree with the assumptions provided in [2], there’s no stage 3 impact to support cell-based ROHC continuity and RNA-based ROHC continuity. When RNA-based ROHC continuity is configured for the UE, and UE resumes in the different gNBs within the RNA, the anchor should be kept for SDT transmission to support ROHC continuity.Add some texts/restriction in the stage 2, or leave it to implementation, either way is fine with us. |
| ZTE | No |  |
| Intel Corporation | No, but | It would be good to clarify how NW handles ROHC continuity when the UE resumes on new gNB (within RNA) but SDT without anchor relocation cannot be used. There may be a case that new gNB may not support SDT without anchor relocation. Like ZTE mentioned below, one possible option could be to limit ROHC continuity when RNA is controlled by only one gNB. Another option could be to make the anchor (knowing new gNB does not support no anchor relocation) release the UE and make it legacy resume.  |
| Huawei | No | When RNA-based ROHC continuity is configured for the UE, and UE resumes in the different gNBs within the RNA resumes in the different gNBs within the RNA, the preferred solution is the anchor shall make decision not to relocate the UE context (i.e without anchor relocation), and handle the SDT transmission to support ROHC continuity. Another option is that the anchor gNB ends the SDT procedure and de-configure the ROHC continuity for UE via the *RRCRelaese* message. |
| China Telecom | No |  |
| LGE | No |  |
| Lenovo, Motorola Mobility | No | It is network implementation on RoHC continuity, that is similar with RoHC continuity configured in handover. We assume it can only be supported in case PDCP is not relocated.  |
| Google | No |  |
| Qualcomm | No |  |
| Samsung  | No |  |
| Nokia | Probably on Xn | In relation with RA SDT come back, we need assistance information from target gNB to anchor gNB to inform if without anchor relocation is not possible so that anchor gNB can release the UE. |

According to the discussion of Q1 and Q2, it seems we could reply the LS to RAN2 to indicate the RAN3 progress on support of ROHC continuity functionality.

#### Q3: Do you agree to reply the LS to RAN2 to indicate the RAN3 progress on support of ROHC continuity functionality?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | We could indicate RAN2 the ROHC continuity functionality could be supported with/without RAN3 impact (pending to the discussion of Q1 and Q2). |
| ZTE | Yes | From the LSin, it seems that RNA can include both one gNB and multiple gNBs. In case of RNA with multiple gNBs, when the UE sends the UL SDT data, because it cannot know whether anchor relocates or not, then it cannot correctly configure ROHC.So that, ROHC continuity functionality shall be supported between the cell and RNA controlled by one gNB.We shall reply LS to RAN2 to confirm that for SDT, ROHC continuity functionality can be configured with both the cell and RNA controlled **by one gNB.** |
| Intel Corporation | Yes | With E1 support, we can get consultation from RAN2 on what would be the desired behavior when the UE (configured ROHC continuity) resumes on new gNB and but SDT without anchor relocation cannot be performed in NW side.  |
| Huawei | Yes | We could indicate RAN2 the ROHC continuity functionality could be supported with/without RAN3 impact (pending to the discussion of Q1 and Q2).See the possible solutions in response to Q2. |
| China telecom  | yes | Agree with Intel. |
| LGE | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |
| Google | Yes |  |
| Qualcomm | Could be | In principle ok, but depends partly on Q1. For sure we could clarify the covered scenario and hence the question from Intel. |
| Samsung  | Yes | RAN3 can show our concern as mentioned by ZTE and Intel |
| Nokia | Yes | Good to check with RAN2 indeed the case brought by ZTE and Intel. |

## Switch from SDT to non-SDT

### UL non-SDT

On how to handle the UL non-SDT data during SDT transmission, contribution [2] provides some analysis on CCCH solution in case of UL non-SDT data arrival, and showed the view that the CCCH based solution is feasible from RAN3 point of view, and there’s no RAN3 stage 3 impact is foreseen. It’s also suggested to send the LS to RAN2 to show the RAN3 analysis.

As the solutions for UL non-SDT are still under discussion in RAN2, and we are not requested to evaluate the solutions, thus, the moderator believes how to support that is pending to RAN2. We will start the RAN3 work, if needed, after RAN2 concluded on the solution in Uu interface.

#### Q4: Do you agree handling of UL non-SDT during SDT transmission is pending to RAN2?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | CCCH/DCCH solutions for UL non-SDT are totally in RAN2 scope, we should not touch this for now. When RAN2 have made some progress, we could further evaluate the selected solution, whether there’s any impact to our interfaces. |
| ZTE | Yes | RAN2 is still discussing this issue, we can wait for RAN2 progress. |
| Intel Corporation | Yes | No need to discuss CCCH vs DCCH in RAN3. Wait for RAN2 progress.  |
| Huawei | No | Considering that it was questioned whether there is any RAN3 impact for CCCH solutions in the question (Q7) in RAN2 email discussion R2-2200026, it’d better for us to discuss the RAN3 impacts for CCCH-based solution from RAN3 point of view. |
| China Telecom | yes | RAN2 are discussing CCCH/DCCH solution. So we can wait the LS/outcome from RAN2. |
| LGE | Yes | RAN2 is already discussing this issue. Wait for RAN2 decision |
| Lenovo, Motorola Mobility | Yes | It would be better to wait for RAN2 progress first.  |
| Google | Yes | Wait for RAN2 decision |
| Qualcomm | Yes |  |
| E/// | Yes | Patiently wait. |
| Samsung  | Yes | This is RAN2 issue. |
| Nokia | Yes | Agree with moderator’s suggestion. |

### DL non-SDT

In the last RAN3 meetings, we discussed how to DL non-SDT during SDT transmission in case of SDT with/without anchor relocation.

Also two solutions were discussed：

* Way 1: sending *RRCResume* message during SDT session.
* Way 2: sending RRCRelease message to end SDT session first, and then another RRC Resume procedure is triggered for anchor relocation.

Based on the discussion, the following WA is achieved:

WA: when applying Way 2 for SDT without anchor relocation, RAN3 assumes the anchor could move the UE back to RRC Inactive by using RRCRelease message.

For SDT with anchor relocation, we almost reached the consensus in the last meeting that way 1 could be applied, and there’s no stage 3 impact is identified. In this case, the full UE context has been allocated to the new receiving gNB during SDT, it’s easier and more efficient to move the UE to RRC Connected state directly by sending a RRCResume message to the UE.

To make further progress, the moderator would like to check do you agree to apply the way 1 for non-SDT transmission during SDT with anchor relocation.

#### Q5: For DL non-SDT, do you agree the way 1 could be applied for SDT with anchor relocation case, and there’s no stage 3 impact identified?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | For SDT with anchor relocation case, of course the way 2 could also be applied, i.e., the new gNB sends the UE to inactive by generating the RRCRelease.As the full UE context has been allocated to the new receiving gNB during SDT transmission, it’s easier and more efficient to move the UE to RRC Connected state directly by sending a RRCResume message to the UE. Furthermore, there’s no stage 3 impact is foreseen. |
| ZTE | Yes |  |
| Intel Corporation | Yes |  |
| Huawei | Yes |  |
| China Telecom | Yes |  |
| LGE | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |
| Google | Yes |  |
| Qualcomm | Yes |  |
| E/// | Yes |  |
| Samsung  | Yes  |  |
| Nokia | Yes |  |

Corresponding stage 2 TPs are provided in [3] and [5] to support DL non-SDT during SDT with anchor relocation. Companies are encouraged to provide the views on the way of the stage 2 work.

#### Q5bis: If the answer to Q5 is yes, whether and how to proceed with the stage 2 work?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | It’s better to have a overall flow for DL non-SDT during SDT transmission. For now, we could focus on the way 1 for SDT with anchor relocation case, the overall procedure in [5] could be taken as the start point.The overall procedure for way 2 for SDT without anchor relocation case still pending to the discussion of Q6 and Q7. |
| ZTE | Yes | Agree with CATT |
| Intel Corporation |  | Slightly prefer to go with Lenovo’s way to add one sentence description. We think non-SDT arrival during SDT with anchor relocation is not worth a new overall flow.  |
| Huawei |  | For DL non-SDT arrival, we agree with Intel. There is no need to have a new call flow and this can be captured by adding a short description. |
| China Telecom |  | Agree with Intel |
| LGE |  | Agree with Intel |
| Lenovo, Motorola Mobility |  | Agree with Intel |
| Google |  | Agree with Intel |
| E/// |  | Agree with Intel |
| Samsung  |  | Prefer to have an overall flow chart, and [5] can be considered as starting point. |
| Nokia |  | Slightly prefer CATT way and add the without anchor relocation case later.  |

For SDT without anchor relocation, it’s proposed to turn the following WA to the agreement [3] [5].

WA: when applying Way 2 for SDT without anchor relocation, RAN3 assumes the anchor could move the UE back to RRC Inactive by using RRCRelease message.

#### Q6: Do you agree to turn the above WA to the agreement?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes |  |
| ZTE | Yes | RAN2 already agreed with it. |
| Intel Corporation | Yes |  |
| Huawei | Yes |  |
| China Telecom | yes |  |
| LGE | Yes |  |
| Lenovo, Motorola Mobility | Yes |  |
| Google | Yes |  |
| Qualcomm | Yes | This can be seen as an early completion of the stage 2 flow  |
| E/// | Yes |  |
| Samsung  | Yes |  |
| Nokia | Yes |  |

In case of way2 as above is agreed, how to trigger the UE to initiate another RRC Resume procedure after *RRCRelease* is discussed in [3] [5], the two possible options were provided:

* Option 1: Use RAN paging to trigger the following-up RRC resume procedure after UE is moved to Inactive state.
* Option 2: Add specific cause value or Indication in *RRCRelease* message to indicate UE to trigger the follow-up RRC resume procedure.

The option 1 is feasible without any stage 3 impact. The option 2 could save the paging procedure, while it may have some impact to *RRCRelease* message, which should be decided in RAN2.

Therefore, it’s proposed to send the LS to RAN2 in [3] [5] for further evaluation the possible solutions, the similar draft LS to RAN2 are provided in [4] [6].

#### Q7: Do you agree to send the LS to RAN2 to further evaluate which option is preferred on triggering of the follow-up RRC resume procedure after RRCRelease for non-SDT transmission?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes | As been discussed in [5], both of the options are feasible. Option 1totally reuses the legacy procedures. Option 2 could save the unnecessary RAN paging procedure, which could speed up the transmission of the DL non-SDT, however the impact to RRCRelease is pending to RAN2.Thus, LS is needed to request RAN2 to further evaluate the potential options on triggering another RRC Resume procedure. |
| ZTE |  | If we agree with option 1, then it has no RAN3 impact (legacy procedure). If we agree with option 2, it also has no RAN3 impact because the IE is as container to UE included in RRCRelease message.So, in our view, we do not need to send LS to RAN2, because both option and option 2 have no RAN3 impact. |
| Intel Corporation | No | Both options are feasible, but we think this is a purely RAN2 issue.  |
| HW |  | Option 2 has the benefit that it can reduce unnecessary RAN paging and the associated paging overhead which is within RAN 3 scope. Hence if option 2 is preferred by RAN3, then RAN3 can send an LS to RAN2 with the recommendation for adopting option 2 indicating the paging overhead reduction benefit. |
| China telecom | yes | Agree with CATT. Both options are feasible. Here we are also support to send a LS to RAN2. |
| LGE | Yes | Agree with Huawei. We also think Option 2 can reduce the Xn RAN paging. But, whether to adopt Option 2 is pending to RAN2 decision. So, a LS to RAN2 is needed. |
| Lenovo, Motorola Mobility | Yes | We don’t think it is a purely RAN2 issue. It is network issue for downlink non-SDT data arrival. It makes sense to send an LS to RAN2. |
| Google |  | Option 1 works. A LS to RAN2 is only necessary if RAN3 shows a clear interest in improving the procedure  |
| Qualcomm | No | Agree with both Intel and Google (and ZTE). This is fundamentally a RAN2 issue, companies can bring up their views in RAN2. Of course both UE and gNB get impacted in some sense (i.e. implementation behaviour, and RRC signalling), but this does not mean we need to send an LS. |
| E/// | No | Option 1 has no impact to RAN3. Option 2 is a pure RAN2 issue and there is discussion on DL data arrival in RAN2. |
| Samsung |  | For option 1, some RAN3 impacts can be foreseen, e.g., the RAN paging message is sent from last serving gNB-CU to serving gNB-CU. However, this RAN paging message may not tell which UE is paged (the paging UE ID in RAN PAGING message, i.e., full I-RNTI, is unknown to serving gNB if the UE sends the RRCResumeRequest message by including short I-RNTI) so that the serving gNB-CU should page the UE in all cells controlled by itself. So, it is better to let last serving gNB to indicate the paged UE ID in RAN PAGING message. For option 2, this depends on when such RRCRelease message is sent to the serving gNB. If the RRCRelease is sent during the context fetch procedure, this option requires the RRCRelease update at the serving gNB. In this sense, we cannot simply say there is no RAN3 impact at this moment. However, before carrying out RAN3 discussion, RAN2 progress is needed on the selection between two options. |
| Nokia | No | Wait RAN2 progress. |

## Others

#### Q8: Please specify if anything is missed above.

|  |  |
| --- | --- |
| Company | Comments |
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|  |  |
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|  |  |

# Discussions (Phase-II)

If needed, in the phase II, we will further discuss:

* the content of the LS out if needed (pending to the discussion of Q3 and Q7)
* the details of the TP work to capture agreements if any.

# Conclusion, Recommendations [if needed]

If needed.

# References

1. R3-220103 LS on the ROHC continuity for SDT (RAN2)
2. R3-220427 (TP to RA-SDT BL CR of TS 38.300) CCCH solution for UL non-SDT arrival and ROHC continuity aspects (Huawei)
3. R3-220499 (TP to 38.300 BL CR) DL non-SDT data and signalling arrival during SDT procedure (Lenovo, Motorola Mobility)
4. R3-220500 [Draft] LS on DL non-SDT data or signalling arrival during SDT transmission (Lenovo, Motorola Mobility) LS out To: RAN2
5. R3-220722 (TP for SDT BL CR for TS 38.300) Handling of non-SDT during SDT transmission (CATT, China Telecommunication)
6. R3-220723 Draft LS on handling of non-SDT during SDT (CATT) LS out To: RAN2
7. R3-220218 (TP for RA-SDT BLCR to TS 38.463) Support of SDT, ZTE
8. [R3-220814](file:///C%3A%5C3GPP-Docs%5CRAN3-Docs%5C2022%5CR3-220814-E1-impact-on-SDT.docx) E1 impact on SDT (China Telecom Corporation Ltd.)
9. [R3-220815](file:///C%3A%5C3GPP-Docs%5CRAN3-Docs%5C2022%5CR3-220815-TP-to-TS38.463-on-the-support-of-SDT-in-E1-interface.docx) TP to TS38.463 on the support of SDT in E1 interface (China Telecom Corporation Ltd.)