3GPP TSG-RAN WG2 #113-e R2-2101964

Electronic Meeting, 25th Jan – 5th Feb 2021

Agenda Item: 7.4.2 DAPS handover Corrections

Source: Huawei, HiSilicon

Title: Report of [AT113-e][211][MOB] DAPS corrections (Huawei)

Document for: Discussion, Decision

# 1 Introduction

This document is to collect companies comment in the following email discussion:

* [AT113-e][211][MOB] DAPS corrections (Huawei)

Scope:

* + - Discuss which DAPS corrections (for LTE and NR) marked for this discussion are seen agreeable
    - Some (or even all) CRs may be merged together if seen needed

Intended outcome:

* + - Discussion summary in R2-2101964 (by email rapporteur).
    - Agreeable CRs (if any)

Deadline for providing comments, for rapporteur inputs, conclusions and CR finalization:

* + - Initial deadline (for companies' feedback): 1st week Thu, UTC 0900
    - Initial deadline (for rapporteur's summary in R2-2101964): 1st week Fri, UTC 09:00
    - Deadline for CR finalization: 2nd week Thu, UTC 1000

**Please fill in your contact information in the end of this document.**

# 2 Discussion

Companies are requested to add their comments in the boxes below.

## 2.1 CP: Minor corrections

Corrections to TS38.300 on DAPS release:

[R2-2101519](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101519.zip) Addition of releasing the source part of DAPS DRBS upon DAPS release LG Electronics France CR Rel-16 38.300 16.4.0 0340 - F NR\_Mob\_enh-Core

Summary of change:

The behavior of releasing the source part of DAPS DRBs is added to the case of receiving an explicit release of DAPS bearer in the clause 9.2.3.2.1 that is for C-plane for handover.

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[R2-2100626](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100626.zip) Miscellaneous corrections for Mobility Enhancements Intel Corporation (Rapporteur), Ericsson CR Rel-16 38.331 16.3.0 2345 - D NR\_Mob\_enh-Core

Summary of change:

**Change 1:comma is added between “configured” and “for”**

If any DAPS bearer is configured**,** for each SRB:”

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[R2-2101533](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101533.zip) Corrections for DAPS Handover MediaTek Inc. CR Rel-16 38.331 16.3.1 2417 - F NR\_Mob\_enh-Core

Summary of change:

<1> In subclause 5.3.5.5.4, include the case of “if any DAPS bearer is configured and the RLC bearer is associated with an SRB”

<2> Restructure subclause 5.3.5.8.3, so that

* For DAPS bearers, specify how they are reverted back to non-DAPS bearers (i.e. target RLF released, PDCP entity reconfigured, etc.) upon T304 expiry, regardless of whether RLF is detected or not.
* For SRBs, separate the procedures to be applied regardless of whether RLF is detected or not (e.g. target PDCP/RLC release) and those applicable only when source RLF is not detected (e.g. resumption of suspended SRB in the source PCell).
* Add a general “revert back to the UE configuration used in the source PCell” to specify that the state variables and parameters of each radio bearer
* For non-DAPS bearers, delete the “revert back” descriptions
* Delete the “revert back” description for SDAP and measurement configurations.

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[R2-2101534](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101534.zip) Corrections for DAPS Handover MediaTek Inc. CR Rel-16 36.331 16.3.0 4580 - F LTE\_feMob-Core

Summary of change:

<1> In subclause 5.3.5.6, add an if-clause for the case that radio link failure has been detected for the source MCG.

* For DAPS bearers, specify how they are reverted back to non-DAPS bearers (i.e. target RLF released, PDCP entity reconfigured, etc.) upon T304 expiry, regardless of whether RLF is detected or not.

For SRBs, specify target PDCP/RLC release.

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[R2-2101568](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101568.zip) Corrections to DAPS handover in LTE ZTE Corporation, Sanechips CR Rel-16 36.331 16.3.0 4583 - F LTE\_feMob-Core

Summary of change:

1. Update the procedure text in 5.3.11.1 as follows:

1> if any DAPS bearer is configured, upon receiving N310 consecutive "out-of-sync" indications for the source PCell from lower layers and T304 is running:

2> start timer T310 for the source PCell;

2. Update the condition “NotFullConfigHO” to “DAPS”, remove all conditions for the presence of the field in the filed description of the IE *daps-HO* to the explanation of the condition “DAPS”.

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## 2.2 CP: Handling of non-DAPS bearers

[R2-2101101](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101101.zip) Handling of non-DAPS bearers during DAPS HO MediaTek Inc. discussion

Summary of this discussion paper:

The key observations are:

**Observation 4: In DAPS HO, UE not only reverts back the UE configuration, but also the data flushed in the previous RLC/PDCP re-establishment when HO command is received.**

**Observation 5: UE needs to create a backup cope and maintain the UE configuration and data buffered for each non-DAPS bearer in DAPS HO, which introduces much complexity in UE implementation.**

And the proposal is:

**Proposal: RAN2 to discuss the issue and select a solution between option 1 and option2.**

* Option 1: UE always perform the RLC/PDCP re-establishment for non-DAPS bearers when HO fails, even if the source PCell has not experienced RLF.
* Option 2: UE suspends non-DAPS bearers upon reception of HO command. UE performs RLC/PDCP re-establishment for non-DSPS bearers when HO succeeds; UE resumes non-DAPS bearer when HO fails.

Actually the similar discussion has been done in R2-2003371 [Post109e#11][MOB] Resolving open issues for DAPS (Intel), and the final decision is as below:

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| **Question 3.7-1: do you see the need to change existing way in the CR, e.g. (impact RRC)**   * Option 1: PDCP re-establishment twice (upon the reception of DAPS handover command and upon the fallback) * Option 2: PDCP re-establishement only when the random access is successfully completed to the target. * Option 3: It is up to implementation * Option 4: same as in the CR, Revert back to the UE configuration used for the DRB in the source, includes PDCP, RLC states variables, the security configuration and the data stored in transmission and reception buffers in PDCP and RLC entities ;   Summary: 12 companies provided inputs  **Fallback handling for Non-DAPS DRB:**  **Option 2, PDCP only reestablishment when RACH is successfully completed in target: 4**  **Option 4: same as existing CR, Revert back to the UE configuration used for the DRB in the source, includes PDCP, RLC states variables, the security configuration and the data stored in transmission and reception buffers in PDCP and RLC entities ; 10**  Rapporteur would suggest to go for majority.  RRC S3.7-1: For non-DAPS DRB handling, do not agree that PDCP only reestablishment when RACH is successfully completed in target: |

In Rapporteur’s understanding, only the final result but not the detailed UE actions is specified for non-DAPS DRBs in current spec. As for the question raised in R2-2101101 “how could it be possible to revert back the data, which has been flushed?”, it’s left up to UE implementation.

**Question:** Do companies agree that reverting-back the ‘discarded’ data for non-DAPS bearer in case of DAPS HO failure is an issue?

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**Question:** if companies think reverting-back the ‘discarded’ data for non-DAPS bearer in case of DAPS HO failure is an issue, and further effort is needed, e.g. in order to reduce the UE complexity for fallback to source cell, which option would companies like to choose?

* Option 1: UE always perform the RLC/PDCP re-establishment for non-DAPS bearers when HO fails, even if the source PCell has not experienced RLF.
* Option 2: UE suspends non-DAPS bearers upon reception of HO command. UE performs RLC/PDCP re-establishment for non-DSPS bearers when HO succeeds; UE resumes non-DAPS bearer when HO fails.
* Option 3: other option.

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## 2.3 CP: DAPS security concerns

[R2-2101501](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101501.zip) Views on several security concerns for DAPS handover Samsung discussion Rel-16 NR\_Mob\_enh-Core

**Proposal 1. Confirm that the network implementation can resolve possible security issue for ROHC when security key is not updated in DAPS handover, e.g. the network can trigger DAPS handover for DRB not configured with ROHC to avoid possible security issue if it does not change the security key.**

**Proposal 2. Confirm that there is no security issue for uplink switching during DAPS handover when security key is not updated.**

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[R2-2101902](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101902.zip) Potential security issue on DAPS handover with key change failure SHARP Corporation discussion Rel-16 NR\_Mob\_enh-Core R2-2010209

**Proposal: Add a NOTE to RRC specifications (both 38.331 and 36.331) to inform that it is left to network implementation to avoid key stream reuse after UE falls back to the source cell due to DAPS handover with key change failure**

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## 2.4 UP Topics

[R2-2101498](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101498.zip) Handling of unforeseen protocol data during DAPS handover Samsung discussion Rel-16 NR\_Mob\_enh-Core

[R2-2101497](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101497.zip) CR for handling of unforeseen protocol data during DAPS HO Samsung CR Rel-16 38.321 16.3.0 1035 - F NR\_Mob\_enh-Core

**Proposal. During DAPS handover, the source MAC entity shall discard the received MAC subPDU for non-DAPS bearer when a MAC PDU including an LCID for non-DAPS bearer is received.**

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[R2-2101499](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101499.zip) Correction on PDCP transmit operation Samsung CR Rel-16 38.323 16.2.0 0064 - F NR\_Mob\_enh-Core, NR\_IIOT-Core

Summary of change:

To remove the parenthesis to make “else” consider all other cases except the activation status of PDCP duplication.

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# 3 Conclusion

Based on the discussion in the previous sections we propose the following:

# Annex

# In order to ease possible offline discussions, all delegates having provided input in this document are requested to fill the following table.

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