draft_R3-212612-E-RABSnoHOto - Version 0.0.3
RAN3

3GPP TSG-RAN WG3 #112-e R3-212612

Online, 17th -27th May 2021

Agenda Item: 8.1

Source: Ericsson (moderator)

Title: Summary of Offline Discussion on CB: # 15_E-RABSnoHOto2G_3G_5G

Document for: Approval

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1 Introduction

CB: # 15_E-RABSnoHOto2G_3G_5G

- (E///) Indicate to eNB if the E-RAB cannot be handed over

- (HW) No spec update needed; add a note in st2

(E/// - moderator) [NWM] Summary of offline disc R3-212612

2 For Chairman Notes

It is proposed to capture in the Chairman Notes the following:

The two issues and solutions are discussed at this meeting.

Issue 1: PS bearers originally set up at 5G and be handed over to 4G, may not be able to be handed over from 4G to 2G/3G or vice versa.

Solution: MME indicated to eNB if the E-RAB can be handed over to 2G/3G or 5G.

Issue 2: Handle the SRVCC failure 5G->4G (IMS added)->(SRVCC) 3G. SA2 has included the Note in TS 23.216 on how to handle it.

Solution: Include a note in TS 36.300.

Proposal 1: The issues are to be discussed at the next RAN3 meeting.

Proposal 2: To be captured as a dedicated ”To Be continued” topic in e.g. AI 8.3

3 Discussion

There are two issues that we discussed:

Issue 1: with the introduction of NR, the PS bearers set up at 5G may not be able to handover to 2G/3G or vice versa, The mobility procedure may be delayed and in the worst case could fail.

Issue 2: SRVCC from 4G to 3G, if the UE was earlier handed over from 5G and having the PS bearer (no voice) from 5G, eNB would perform SRVCC with two Iu connections (Iu-CS and Iu-PS) and informs the target RNC. But the Forward Relocation Request message may never be sent to the target node due to the QoS flow established in 5G does not contain Transaction Identifier (TI) and this TI is mandatory in the Forward Relocation Request message. This causes the SRVCC delay and in the worst case could even cause failure.

In **R3-211766/67/68, ref [1], [2], [3]**, Ericsson point out the **Issue 1** that when the E-RAB from 5G has been handed over to 4G, it cannot be further handover to 3G. This issue exists when there is a IMS voice to be handed over to 3G in SRVCC, it also exist when it is pure PS Handover without SRVCC. It is proposed that: **Proposal 1:** RAN3 to discuss and agree to indicate to eNB if the E-RAB can be handed over to 2G/3G or 5G.

In **R3-212148/49 ref [4], [5]**, Huawei indicated two proposals on SRVCC, **Issue 2**: **Proposal 1:** No specification update is needed for 5G SRVCC to 3G. **Proposal 2:** Add a note TS 36.300 for 4G to 3G SRVCC in Rel-16.

Please note that ”5G SRVCC to 3G” is only about IMS voice. It is not related so there is no need to further discuss. We only need to discuss the **Proposal 1** from Ericsson, which is for **Issue 1** and **Proposal 2** from Huawei which is for **Issue 2**.

At the last RAN3 meeting, in the **LS from SA2**, ref [6], to avoid the **SRVCC failure 5G->4G->(SRVCC) 3G**, SA2 added a note in TS 23.216 ”*NOTE: Depending on operator’s policy, when 5GS is deployed, the eNB can switch the PS HO off when it initiates SRVCC procedure, i.e. SRVCC only for CS voice*.” This is to provide a way forward for **Issue 2 only**.

In order to proceed, please provide your comments on the below issues and solutions.

Issue 1: PS bearers set up at 5G may not be able to handover to 2G/3G or vice versa.

Solution 1: CN indicate to eNB if the E-RAB can be handed over to 2G/3G or 5G, refer to [2]

Feedback Form 1: You comments on the solutions for Issue 1.

1 – Ericsson LM We support Solution 1.
2 – HUAWEI TECHNOLOGIES Co. Ltd. For issue 1, so far only the handover with SRVCC operation from NR to UTRAN is supported. This is clearly specified in RAN specifications and SA2 specifications. If issue 1 intends to address the pure PS Handover from NR to UTRAN without SRVCC, this should involve SA2 first since the 5G and 3G interworking is not supported since R15 (except SRVCC). Given that this is a big system impact, RAN3 can not make decisions alone.

So we disagree with Solution 1.

3 – Nokia France

Same view as Huawei. Issue 1 is not acknowledged and would require SA2 involvement.

4 – Deutsche Telekom AG

Same view as Huawei and Nokia.

5 – ZTE Corporation

Same view as Huawei and Nokia.

6 – Qualcomm CDMA Technologies

Same view as Huawei and Nokia.

7 – VODAFONE Group Plc

[Vodafone] My understanding of issue 1 is not about direct handover from 5G to 2G/3G but that a bearer that has ”visited” 5GS and then moved to LTE-EPC will then fail to be handed over from EPC to 2G/3G. There is ongoing discussion of R17 CRs to partially solve this issue in the current SA2 meeting (SA2#145e finishes 1 day after this RAN 3 meeting) on this topic.

The ”partial” solution aims to make EPC -> 5GS -> EPS -> 2G/3G mobility work for bearers established in EPC, but it does not aim to solve the case of EPS to 2G/3G mobility for PDN connections/flows established in 5GS. In the latter case, the intention is that the PDN connection is ultimately re-established in EPC and it can then be able to support full mobility. (See latest revision of, e.g. S2-2104681r20).

Because it seems that there will always be some cases when handover of a bearer from EPC to 2G/3G is not possible, it could well be useful for the MME to provide the eNb with information on whether that bearer can be handed over to 2G/3G.

Issue 2: Handle the SRVCC failure 5G->4G->(SRVCC) 3G.

SA2 has included the Note in TS 23.216 on how to handle it.

Solution 1: Include a note in TS 36.300, refer to [5].

Feedback Form 2: You comments on the solutions for Issue 2.

1 – Ericsson LM

Solution 1 refers to the updates in TS 23.216. We do not see the need to duplicate the Stage 2 changes.

2 – HUAWEI TECHNOLOGIES Co. Ltd.

TS 38.300 clearly describes that only voice bearer is handed over for 5G->3G (SRVCC).

So taking the same logic, for 5G->4G->3G (SRVCC), we can add a note in TS 36.300. Otherwise, there are no clear descriptions in RAN specification to limit the eNB behavior in the Handover preparation procedure, hence, the eNB may handover other PS bearers to the target RAT for SRVCC handover.

3 – Nokia France Agree with Ericsson: specification text added in TS 23.216 should be enough.
4 – Deutsche Telekom AG Preference for Huawei's proposal to add a note in 36.300.
5 – ZTE Corporation Share the view as Huawei.
6 – Qualcomm CDMA Technologies No strong view on this. Adding note to 36.300 does not harm.
7 – VODAFONE Group Plc [Vodafone] I think some text on 36.300 would be useful to clarify that the impact of the SA2 CR is that it impacts all UEs in the PLMN that perform SRVCC from 4G to 3G and not just 5GS capable UEs. Alternatively, RAN groups could suggest some finer granularity for RAN configuration.

4 Conclusion

Proposal 1: the issues are to be discussed at the next RAN3 meeting. To be captured as "To Be continued" topic.

5 Reference

[1] R3-211766 Indicating E-RABs that cannot be handed over to 2G/3G or 5G (Ericsson)

[2] R3-211767 Indicating E-RABs that cannot be handed over to 2G/3G or 5G (Ericsson)

[3] R3-211768 Indicating E-RABs that cannot be handed over to 2G/3G or 5G (Ericsson)

[4] R3-212148 Discussion on E-RABs that cannot be handed over to 2G/3G (Huawei)

[5] R3-212149 Discussion on E-RABs that cannot be handed over to 2G/3G (Huawei)

[6] R3-211456 LS on E-RABs that cannot be handed over to 2G/3G or 5G (SA2)