CB: # 10_PositionPRU - Version 0.0.4
RAN3

3GPP TSG-RAN WG3 #113-e R3-2141412

Online, 16-26 August 2021

Agenda Item: 8.1

Source: Ericsson

Title: CB: # 10_PositionPRU

Document for: Discussion

1 Introdcution

This is the SoD of the following CB:

Table 1:

CB: # 10_PositionPRU **- No specifications impacts in RAN3 based on the current agreements in RAN1? HW** **- RAN3 specification needs to support part of the positioning related functions currently transported through LPP PDU, and different protocol option would bring different impacts on specification? CATT** **- It is not precluded to support the desired PRU functionality today by implementation in NG-RAN, with no need for standards impact. NRPPa already supports signaling the geographical position and known location of a TRP from the NG-RAN to the LMF? Take R3-213842 analysis into account if needed E///** **- All LPP positioning methods can be supported by a PRU, dependent on PRU capabilities□Whether the Positioning Reference Unit (PRU) is considered as part of a gNB from LMF point of view or not□In the case the Positioning Reference Unit (PRU) is considered as part of a gNB from LMF point of view, specify a new NRPPa/F1AP message pair to transport an LPP container□Send LS to SA2 and RAN2? Qualcomm** (E/// - moderator)

2 For the chair's notes

Reply to RAN1:

On the basis of the information given by RAN1, RAN3 could not reach consensus nor understanding on what a PRU is. RAN3 would like to remind RAN1 that architecture design for positioning is the joint responsibility of RAN2 and RAN3.

3 Discussion

Feedback Form 1: Whether the PRU is considered as part of gNB (e.g. TRP) or UE from RAN3 point of view?

1 – Ericsson LM from the RAN1 LS, we understand that PRU is a subset of a UE
2 – HuaWei Technologies Co. No clear statement in the LS shows that the TRP can be a PRU. For save reason, ok to double check with RAN1 since this needs the TRP send UL SRS like UE does.
3 – Nokia Our understanding from RAN1 discussion and LS is that PRU is ”UE-like”.
4 – Samsung R&D Institute UK RAN1 LS does not say PRU is UE. From the LS, we understand PRU is a unit with known location and is capable of sending/receiving positioning signals and communicating with LMF, our understanding is PRU can be TRP or UE or both
5 – Qualcomm Technologies Int As per analysis in R3-213399, both are feasible, with different impacts on different parts of the system. The decision needs to be made with regards to the full picture.
6 – CATT Positioning Reference Device (PRU) is a device with known location and capable of at least the following positioning functionality, which can either be UE or TRP. - Provide the positioning measurements (e.g., RSTD, RSRP, Rx-Tx time differences) - Transmit the UL SRS signals for positioning

Moderator’s conclusion: Based on RAN1 LS, companies could not reach consensus nor understanding on what a PRU is.

Feedback Form 2: Please describe the specification impacts to support a PRU in the scenario it is considered as UE?

1 – Ericsson LM If PRU is considered a UE, it is outside of RAN3 scope
2 – HuaWei Technologies Co. no RAN3 impact if the UE is PRU.
3 – Nokia No RAN3 impact for ”UE-like” PRU.

4 – Samsung R&D Institute UK

No RAN3 spec impact if PRU is UE

5 – Qualcomm Technologies Int

As per R3-213399, we expect no RAN3 impacts (NRPPa, or NG-RAN node architecture / behaviour)

6 – CATT

No RAN3 impact for UE-like PRU.

Moderator: companies consider that there would be no RAN3 impacts in case PRU is a UE.

Feedback Form 3: Please described the RAN3 specification impacts to support a PRU in the scenario it is considered as TRP?

1 – Ericsson LM

No specification impacts and up to gNB implementation. An inception-like positioning where LPP is transported inside NRPPa, which itself is transported inside NG-AP is too convoluted and complex.

2 – HuaWei Technologies Co.

yes, can further study the RAN3 impact once RAN1 confirms that the TRP can also be a PRU.

3 – Nokia

If PRU is ”TRP-like”, this will have RAN3 specification impacts (as well as significant gNB functional impacts). There is no need for RAN3 to study ”TRP-like” PRU unless feasibility of ”UE-like” PRU is challenged in RAN1/RAN2

4 – Samsung R&D Institute UK

If TRP is considered as a PRU, the impact on RAN3 depends on whether new information is needed for supporting positioning as PRU. Since there are still many FFSs in RAN1, we’d better discuss the impact when the solution is clear.

5 – Qualcomm Technologies Int

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As per R3-213399, one solution is to make small modifications to NRPPa
    to enable transport of LPP PDUs. The reuse of existing protocols (
   LPP and NRPPa)can minimize overall impacts e.g. no AMF impact and
   very minor impact in the NG-RAN node (and no LPP impact). Of course
    this can be considered further if we go in this direction.
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6 – CATT

In case of TRP as PRU, RAN3 specification needs to support part of the positioning related functions currently transported through LPP PDU, e.g, including:

1) PRU capability and/or PRU location related information interaction function between LMF and TRP as PRU

2) Assistance data transfer function for PRS configuration of neighbour cells

3) Location Information Request / Reporting function for DL positioning method.

4) The TE difference value request and reporting function between LMF and TRP as PRU.

Besides, how to implement the signalling procedure between LMF and TRP as PRU also has different impact on RAN3 specification. Please refer to our paper [R3-213672] for detail analysis.

Moderator's conclusions:

1. **From the inputs given, there is no consensus nor clear understanding on the impacts or even what a PRU is. If the PRU is a UE, this is a RAN2 topic. If the PRU is a TRP, it relates to both RAN2 and RAN3 architecture design. In all cases, we cannot continue the discussion based on something that RAN1 is trying to introduce beyond their Terms of Reference. We can leave the discussion to RAN2.**

Based on the above input, it is proposed to draft the LS reply as below.

On the basis of the information given by RAN1, RAN3 could not reach consensus nor understanding on what a PRU is. RAN3 would like to remind RAN1 that architecture design for positioning is the joint responsibility of RAN2 and RAN3.

4 References

Table 2:

R3-213109	LS on Positioning Reference Units (PRUs) for enhancing positioning performance (RAN1)
R3-213608	Discussion on Positioning Reference Units (PRUs) for enhancing positioning performance (Huawei)
R3-213609	[Draft] reply LS on Positioning Reference Units (PRUs) for enhancing positioning performance (Huawei)
R3-213672	Consideration on Positioning Reference Units (PRUs) (CATT)
R3-213678	[Draft] Reply LS on Positioning Reference Units (PRUs) (CATT)
R3-213843	Draft Reply LS on Positioning Reference Units (Ericsson)
R3-213399	Signalling and Procedures for supporting Positioning Reference Units (Qualcomm Incorporated)