3GPP TSG-RAN WG2 Meeting #115-e ***R2-210xxxx***

Electronic Meeting, August 16 – 27, 2021

**Agenda item:** 8.11.2

**Source:** Qualcomm Incorporated

**Title:** Summary of [AT115-e][614][POS] Reply LS to SA2 on capability storage (Qualcomm)

**Document for:**  Discussion

# 1. Introduction

This document summarizes the following email discussion:

* [AT115-e][614][POS] Reply LS to SA2 on capability storage (Qualcomm)

Scope: Reply to SA2 indicating that positioning capability is variable. We will give a finer-grained response e.g., which capabilities can vary only if consensus can be reached.

Intended outcome: Approvable LS in R2-2108945

Deadline: Tuesday 2021-08-24 0800 UTC

## 1.1 References

[1] [R2-2106971](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2106971.zip), "LS on storage of UE Positioning Capabilities (S2-2105153; contact: Qualcomm)" , SA2 LS in Rel-17 5G\_eLCS\_ph2, To:RAN2 Cc:RAN3.

[2] [R2-2108378](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108378.zip), "[draft] Response LS on storage of UE Positioning Capabilities", Qualcomm Incorporated, LS out Rel-17 To:SA2, Cc:RAN3.

[3] [R2-2108377](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_115-e/Docs/R2-2108377.zip), "LPP impacts for UE positioning capability storage", Qualcomm Incorporated.

# 2. Discussion

The incoming LS from SA2 [1] is copied below:

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| SA2 has agreed the attached CR to TS 23.273 to support storage of UE positioning capabilities in the 5GC, and thereby consider enabling some reduction in latency when positioning a UE.  In addition, SA2 would like to confirm with RAN2 that the following question:  1) Whether the UE positioning capability is variable or not? If yes, in which situation it is changed?  **To RAN2**  **ACTION:** SA2 kindly requests RAN2 to provide feedback on the above issue. SA2 also asks RAN2 to take the above CR into account in supporting positioning enhancements in Release 17, if necessary. |

Accordingly, this email discussion scope has two parts:

"Reply to SA2 indicating that positioning capability is variable" (see section 2.1 below).

"We will give a finer-grained response e.g., which capabilities can vary only if consensus can be reached" (see section 2.2 below).

## 2.1 Reply LS

A draft reply LS has been been provided in the drafts folder for this email discussion. The proposed text is copied below:

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| **1. Overall Description:**  RAN2 thanks SA2 for their LS and CR0176 (Rel-17, 'B') to TS 23.273 on storage of UE Positioning Capabilities.  Regarding the question from SA2 whether the UE positioning capability is variable or not, RAN2 would like to provide the following response:  The UE positioning capability can be variable.  RAN2 understanding is that this is also the case for UE radio capabilities which are stored in AMF.  **2. Actions:**  **To SA2 group.**  **ACTION:** RAN2 kindly asks SA2 to take the above information into account. |

**Question 1:** Do you have any comments on the proposed reply LS above?

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| **Company** | **Comments** |
| ZTE | SA2 has asked in what situation it is changed. The situations or examples of capability change should be also included in the reply LS, i.e., section 2.2. |
| Ericsson | We need to add  RAN2 understanding is that this is also the case for UE radio capabilities which are stored in AMF. |
| Apple | The LS as proposed by the rapporteur is fine. |
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## 2.2 Finer-grained response

Some example situations in which the UE positioning capability may change were discussed in [3].

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| - **LMF dependency:** A UE would not report capabilities that are not requested by an LMF. Thus, if a PLMN uses LMFs from different vendors or dedicated to different user cases (e.g., regulatory versus commercial), different capabilities could be reported.  - **Radio configuration dependency:** Positioning capabilities based on current/active radio configuration are obviously not static (e.g., the *srs‑PosResourceConfigCA-BandList* [8] is provided for the current configured CA band combination).  - **Power Savings:** A (e.g., IoT) UE whose battery level is low may switch off positioning support in order to conserve battery power for more important tasks such as communicating with an external server or may report lower processing capabilities (e.g., lower DL-PRS processing capabilities, or single-frequency GNSS capabilities instead of dual-frequency, or single-GNSS instead of multi-GNSS capabilities, etc.).  - **Processing Resources Constraints:** The available processing resources (processors, memory, etc.) may be shared between "communication" and "positioning operations". If the "communication operation" requires increased processing resources (for example, a large number of carriers to aggregate), the resources allocated to the "positioning operation" may temporarily be reduced (e.g., lower DL-PRS processing capabilities, or single-frequency GNSS capabilities instead of dual-frequency, or single-GNSS instead of multi-GNSS capabilities, etc.).  - **Privacy / User Interaction:** A user may be allowed to disable location support for non-regulatory services (e.g. for a location request from an external non-regulatory LCS Client). In that case, when an LMF requests the positioning capabilities of the UE, the UE may reply with no positioning capabilities or with some limited minimal set of capabilities. An exception would be if the UE is aware of an emergency services call when the UE would provide its full capability set to an LMF.  NOTE: The examples and scenarios above may not be supported on all UEs and may not always need to be supported. However, a UE vendor may still offer users some form of control over UE location capability as described above. |

**Question 2:** Should RAN2 provide example situations in which the UE positioning capability may change or not? If your answer is "YES", do you have any comments on the above list, e.g., any additions, etc.?

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| Company | Answer  YES/NO | Comments |
| ZTE | Yes |  |
| Ericsson | No | UE can always send an unsolicited updated capability which LMF can override with the one retrieved from AMF storage  Further, privacy and storing positioning capability has no relations. This is exclusive anyways. The UE can notify change of UE’s privacy profile  TS 23.271 says 7.4.3 LCS Privacy Profile Update notification The LCS Privacy Profile Update notification is sent to the H-GMLC from the PPR in order to notify the H-GMLC about the change of UEs privacy profile.  - Target UE identity, (one or both of MSISDN and IMSI);  - Indication on the changed UEs privacy profile |
| Apple |  | We prefer to provide a short reply. Having said that, since SA2 did ask about details, we would also be OK to provide some examples – as long as the text is clear that those are just examples and not an exhaustive list. |
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