

94e-56-ESTI_UAV_LS - Version 0.0.5
RAN

3GPP TSG RAN#94e

RP-213633

Electronic Meeting, December 06 - 17, 2021

Agenda Item: 14

Source: Ericsson

Title: Moderator's summary for discussion [94e-56-ESTI_UAV_LS]

Document for: Information & Discussion

1 Introduction

In RAN2#116-e, RAN2 received an LS from ETSI TC LI in R2-2110295. Based on 3GPP TR 36.777 "Study on Enhanced LTE Support for Aerial Vehicles", the LS raises doubts whether LTE/NR positioning mechanisms can meet regulatory requirements in use cases where the UE is in a drone. The LS argues that this is due to that drones may be served by back lobes of cell sites.

The LS was briefly discussed in RAN2 but no reply was sent from RAN2#116-e. Instead, RAN2 recommended TSG RAN plenary to discuss and decide concrete actions. In this NWM thread, TSG RAN is discussing a potential response LS.

2 Initial Round

2.1 Discussion

Tdoc RP-213458 discusses the matter and especially analyzed the NR work done by 3GPP RAN in Rel-16. The Tdoc describes that regulatory and commercial target performance requirements for RAT dependent solutions were captured in TR38.855 during the Rel-16 NR Positioning Study Item. The following Rel-16 NR Positioning Work Item (WI) specified solutions to enable RAT dependent (for both FR1 and FR2) and RAT independent NR positioning techniques while considering E911 (e.g. floor level) and commercial requirements for horizontal and vertical positioning accuracies according to TR38.855 (see WID RP-200218). The Rel-16 WI was successfully completed in September 2020 (see WI summary in RP-201987).

Tdoc RP-213458 further analyzed the LTE work done by 3GPP RAN in Rel-9 and the enhancements of Rel-13, where 3D radio propagation models were used and horizontal as well as vertical accuracy requirements were considered.

Tdoc RP-213458 concludes that the 3GPP positioning procedures in both LTE and NR can fulfil the regulatory requirements (and even the stricter commercial requirements) and proposes to respond accordingly to ETSI TC LI:

Overall Description:

RAN acknowledges that positioning was not considered explicitly in the development of 3GPP TR 36.777. However, RAN would like to clarify that the 3GPP positioning features for both LTE and NR can meet the regulatory and commercial requirements specified 3GPP TR 38.855.

ACTION: RAN asks ETSI TC LI to take the above information in to account in their future work.

During the Initial Round, please provide your comments on the above matter and the proposed LS response.

Feedback Form 1: Comments on drone positioning and the proposed LS response to ETSI TC LI

1 – Nokia Corporation

The proposed answer looks good from our point of view. It is good to notice that the a bit better UAVs are also expected to have GPS etc. as well and satellite visibility likely to be very good, thus such a solution can be also used as well.

2 – vivo Mobile Communication Co.

We agree the current positioning features for both LTE and NR can meet the regulatory and commercial requirements specified 3GPP TR 38.855. So the proposed answer is fine to us.

3 – ZTE Corporation

We are also fine with the current drafting. Regarding the 3-D positioning for the drone, it should be noticed that multiple techniques can be used to fix the position in both vertical and horizontal domains, e.g., barometer, GNSS, etc.

4 – Samsung Electronics Co.

We are fine with the proposed response.

5 – OPPO

We are fine with the proposed LS response. We also hold the opinion that the current positioning techniques could implicitly support UAV with some height from the ground. Besides, UAV scenario would have more chances on line-of-sight propagation which is beneficial to some positioning techniques.

6 – Qualcomm Incorporated

On the technical side, while generally speaking we share similar view here, the proposed reply seems to suggest that the regulatory and commercial requirements are met unconditionally for drones/UAVs. We recognize that there may be challenges in certain scenarios which have not been properly studied yet, e.g. for a drone flying high above a dense urban area like New York City (if allowed). Of course, GPS/GNSS can probably nearly always be used (though not necessarily for a drone in a covered area where GPS satellites visibility may be challenging).

Therefore, we think a more appropriate response might include conditions and limitations instead of blanket guarantees from 3GPP. There have in fact been studies on location support for drones (e.g. in ATIS) on which quite a lot of time was spent but that did not come up with a simple blanket statement like the one in the proposed response. A better LS response could be to say something along the lines that 3GPP positioning features should typically meet regulatory and commercial requirements, e.g. when GPS/GNSS is available, but there may be conditions when location capability may be more limited.

On the logistical side, given that the LS was sent only to RAN2 (and not to RAN), RAN2 may be tasked by RAN to reply but we have no strong view if RAN plenary wants to intercept and reply directly.

7 – Ericsson LM

As indicated in our paper on this topic, we believe that the 3GPP specifications support positioning of drones using 3GPP based procedures, i.e. not relying on GPS. It is possible to build a network which allows this. We note that the ETSI TC LI LS mentions "validation", and validation of GPS position cannot be done using GPS. We believe that our original LS-wording correctly reflects what the 3GPP specification supports and hence prefer to stick to our original wording for the reply.

8 – Deutsche Telekom AG

We wonder why this comes up to plenary ? This has been sent to RAN2 and is in the expertise of RAN2 to provide an answer.

We agree that the proposed answer is sufficiently good and we should task RAN2 Chair to sent an RAN2 LS back to ETSI with the RAN agreed wording.

9 – HUAWEI TECHNOLOGIES Co. Ltd.

Huawei, HiSilicon general we are fine to reply from RAN to save RAN2 time. Also the wording from Ericsson is fine for us. Only one typo to be fixed in one sentence **3GPP TS 36.777 -> 3GPP TR 36.777**

10 – Intel Corporation (UK) Ltd

We agree with the observation in RP-213458 that regulatory requirements can be fulfilled in both LTE and NR, and the wording of the LS is acceptable.

Furthermore, we think it is appropriate for RAN to respond to the LS given that the RAN2 Chair's status report includes a an explicit request to RAN#94e to reply directly or to provide guidance for RAN2 to reply.

2.2 Summary and next steps

All companies agreed to send an LS response and also agreed with the proposed text in general.

One company felt that the proposed LS response seems to suggest that the regulatory and commercial requirements are met unconditionally. They proposed to include conditions and limitations.

- The moderator would like to note that the proposed reply states that the standards can meet the requirements. Of course, the actual positioning accuracy is subject to proper implementation and network deployment (and UE/drone location). In addition to the wording "...can meet...", the moderator will add a statement in brackets clarifying the above. Let us discuss during the Intermediate Round, whether such additional statement is appropriate.

It was discussed whether RAN2 or RAN should respond and most companies agreed that RAN should respond.

One typo (TS36.777 -> TR36.777) was detected, which has been corrected from the Intermediate Round onwards.

3 Intermediate Round

3.1 Discussion

A draft LS response is provided in the drafts folder ("draft RP-213648 LSout on drone positioning to ETSI TC LI - Intermediate Round"), which contains the following:

1. Overall Description:

TSG RAN thanks ETSI TC LI for their liaison titled "Location Services: Drones".

TSG RAN acknowledges that positioning was not considered explicitly in the development of 3GPP TR 36.777. However, RAN would like to clarify that the 3GPP positioning features for both LTE and NR can meet the regulatory and commercial requirements specified 3GPP TR 38.855. [Note that, actually meeting the requirements is subject to proper implementation and network deployment.]

2. Actions:

TSG RAN asks ETSI TC LI to take the above information into account in their future work.

During the Intermediate Round, please provide your feedback to the draft LS response, especially the statement in brackets.

Feedback Form 2: Feedback and comments on draft LS response

1 – Ericsson LM
Given it says that the "3GPP positioning features for both LTE and NR <i>can</i> meet the regulatory and commercial requirements" we don't see a strong need for the statement in the brackets. What we do in 3GPP is to specify features in our specifications and the draft LS reply say that these specified features can meet the requirements. Of course, to actually meet the requirements in a particular deployment, one must deploy the network/features in a correct manner. This should be clear to everyone here and to ETSI TC LI as well.
2 – Xiaomi Communications
We are fine with the draft LS response provided above.
3 – ZTE Corporation
We share the views that proper deployment and implementation should be the basic assumption on certain techniques and the sentence in the bracket can be removed.
4 – Qualcomm Incorporated
Unfortunately, the text in square brackets do not address our earlier concern. We would like to remind that the LS is about future use cases where a non-UAV UE may be held by a passenger who may be flying inside

a Drone vehicle. 3GPP has not studied such a scenario before. It is not just about correct implementation or deployment.

The first sentence correctly states that Rel-15 LTE UAV work didn't look into this aspect specifically. Then, while the second sentence does not specifically spell out Drones/UAVs, being in the same paragraph seems to imply that all the regulatory and commercial requirements described in the TR 38.855 can be unconditionally met for all types of UEs, including flying UEs inside UAVs or other Drones, for both LTE and NR. We also want to point out that the question from ETSI TC LI concerns LTE support for aerial vehicles and not NR support, so TR 38.855 conclusions would be less relevant.

The fact remains that there was no study of location support for aerial vehicles (neither for LTE nor NR) so no one really knows to what degree and under what conditions regulatory and commercial requirements will be supported. For example, we know that GPS-based location may not be precise inside commercial airplanes today and we don't know enough about how the inside of the future drones differ from the inside of commercial airplanes today. Similarly, even for terrestrial-based UE positioning we do not know about the anticipated performance given the larger uncertainty in height.

We recognize we are in minority here, but we do not feel comfortable to even remotely imply anything in the response that has never been studied specifically and not concluded before. While we think it is likely that support will often be possible, a blanket unconditional endorsement appears excessive.

Having said that, if 3GPP RAN decides to go ahead with the response in spite of our comments, we would not object but would kindly request all our comments and concerns to be minuted.

5 – Samsung Electronics Co.

We are fine with the draft LS for now, and also fine to remove the sentence in the bracket. QC's concern can be addressed later if the real issue is identified e.g. from the field.

6 – vivo Mobile Communication Co.

We are fine with the draft LS . No strong view to remove the sentence in the bracket.

7 – OPPO

We are fine with the darft LS reponse above.

8 – HUAWEI TECHNOLOGIES Co. Ltd.

Huawei, HiSilicon We are fine with the draft LS but we think the part in brackets should be removed (for the reasons expressed before by others).

9 – Intel Corporation (UK) Ltd

The LS is acceptable to us. The part in square brackets adds little value in our view as all aspects of the system require careful implementation and deployment in order to perform as expected. But we could also accept it to be included if preferred by the majority.

3.2 Summary and next steps

All but one company agreed to the draft LS response. No company argued to keep the statement in brackets. So the moderator will remove the statement.

One company raised concerns that 3GPP has not explicitly studied the positioning accuracy in drones scenarios, e.g. a non-UAV UE inside a flying drone. They didn't want to give an unconditional endorsement about regulatory requirements. As also indicated by that one company, the moderator proposes to go ahead with the LS response and to minute their concern.

4 Final Round

The moderator proposed to skip the Final NWM Round and to conclude the following:

The draft LS response in RP-213648 can be approved and the final LS sent in RP-213674.

- However, a typo was detected and the final LS should say "...requirements described in 3GPP TR 38.855"

It is noted that one company had concerns sending the LS because 3GPP has not explicitly studied the positioning accuracy in drone scenarios, e.g. a non-UAV UE inside a flying drone.

- However, Qualcomm asked to note their concern as follows: "Qualcomm has concerns sending the LS because 3GPP has not explicitly studied the positioning accuracy for UAV UEs and in other drone scenarios, e.g. a non-UAV UE inside a flying drone."

5 Final Summary

- **This discussion summary in RP-213633 will be noted**
- **The LS response is approved in RP-213674**
- **The following is to be captured in the meeting minutes: "Qualcomm has concerns sending the LS because 3GPP has not explicitly studied the positioning accuracy for UAV UEs and in other drone scenarios, e.g. a non-UAV UE inside a flying drone."**