3GPP TSG-RAN WG3 #117-e R3-225063

15 - 24 Aug 2022

Online

**Agenda Item: 9.2.8**

**Source: ZTE - Moderator**

**Title:** **Summary of Offline Discussion on CB: # 54\_LRC**

**Document for: Approval**

# **Introduction**

**CB: # 54\_LRC**

* **Whether such case will happen, and whether there is any IoT issue caused by unexpected propagation of the *Area Of Interest List* IE between NG-RAN nodes?**

(ZTE - moderator)

Summary of offline disc [R3-225063](Inbox%5C%5CR3-225063.zip)

Please Note:

There would be two rounds of email discussion.

The 1st round is to be ended by Friday of first week (23:59 UTC, 19 Aug).

The 2nd round is to be ended 3 hours before the email deadline at second week (9:00 UTC, 23 Aug).

# **2 For the Chairman’s Notes**

Propose to capture the following:

# **3 Discussion (1st round)**

It is proposed in [1] that some procedure text or IE description should be added for the handling of Area of Interest List IE when RAN receives the Location Report Control message from AMF. The intention is to clarify in RAN3 spec that the NG-RAN shall store the received Area of Interest List IE when the event type IE is set to ‘UE presence in the area of interest’, to make the RAN3 spec aligns with SA2 spec (23.502).

During the online discussion, there was no consensus on whether the concerned case proposed in the CR would happen. According to the specification of SA2, it only says that ‘If the Reporting Type indicates to start the NG-RAN to report when UE moves out of or into the Area Of Interest, the AMF also provides the requested Area Of Interest information in the Location Reporting Control message’, but it does not preclude any other cases, for example, AMF may set the Request type to other values and provide the area of interest as well. The text in 23.502 is pasted below:

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| --- |
| 1. AMF to NG-RAN: Location Reporting Control (Reporting Type, Location Reporting Level, (Area Of Interest, Request Reference ID)). The AMF sends a Location Reporting Control message to the NG-RAN. The Location Reporting Control message shall identify the UE for which reports are requested and shall include Reporting Type and Location Reporting Level. The Location Reporting Control message may also include Area Of Interest and Request Reference ID. Location Reporting Level could be TAI+ Cell Identity. Reporting Type indicates whether the message is intended to trigger a single standalone report about the current Cell Identity serving the UE or start the NG-RAN to report whenever the UE changes cell, or ask the NG-RAN to report whenever the UE moves out or into the Area Of Interest. If the Reporting Type indicates to report whenever the UE changes cell and if PScell reporting is requested and Dual Connectivity is in use, the Master RAN node shall also report to the AMF whenever the PSCell changes. If the Reporting Type indicates to start the NG-RAN to report when UE moves out of or into the Area Of Interest, the AMF also provides the requested Area Of Interest information in the Location Reporting Control message. The AMF may include a Request Reference ID in the Location Report Control message to identify the request of reporting for an Area Of Interest. If multiple Areas Of Interest are included in the message, the Request Reference ID identifies each Area of Interest. |

According to 23.502, it can only be assumed that ‘UE presence in area of interest’ + ‘Area of interest’ is a right pair to the RAN node, which would usually be the case, if it is correctly settled by AMF. But there is not a clue in SA2 specification that AMF would never send the area of interest with another Request type; hence RAN3 cannot make such an assumption that AMF would always send the right request type for area of interest.

Please companies provide views on this question below.

**Q1: Will it happen that the Area of Interest List IE is present, with a reporting type other than ‘UE presence in the area of interest’?**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| ZTE | Yes | According to SA2 spec, the case that area of interest is sent with another request type is not precluded. There is not a clue in SA2 specification that AMF would never send the area of interest with another Request type. RAN3 cannot make such an assumption that AMF would always send the right request type for area of interest. |
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Another argument is about whether there would be any IoT issue caused by the unexpected propagation of the useless information. Let’s consider the following case to further evaluate this issue.

If there are two NG-RAN nodes with different kinds of implementation based on their own understanding of the specifications:

- **Implementation of NG-RAN node 1**: no matter what the reporting type is, NG-RAN shall store the area of interest.

- **Implementation of NG-RAN node 2**: when the reporting type is ‘UE presence in the area of interest’, NG-RAN stores the area of interest and use it to track UE’s location.

And if for some reason, AMF sends the area of interest to NG-RAN with another reporting type to NG-RAN, the NG-RAN node 1 would store the area of interest and it is possible that this information might be propagated to NG-RAN node 2.

In this case, once the area of interest if propagated from NG-RAN node 1 to NG-RAN node 2, while the reporting type is not about UE presence in the area of interest, the NG-RAN node 2 would be confused and deem that the NG-RAN node 1 is problematic. This is a severe IoT issue that should definitely be avoided.

Companies are welcome to provide more opinions on any other IoT issue it may cause.

**Q2: Whether there is any IoT issue caused by unexpected propagation of the Area Of Interest List IE between NG-RAN nodes?**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| ZTE | Yes | There would be IoT issue if the implementation of NG-RAN nodes is different, based on the designers’ different understanding on the specifications, as discussed above. So it should be clarified in RAN3 spec that when the reporting type is ‘UE presence in the area of interest’, NG-RAN node shall store the information and use it for UE location tracking.This problem due to different implementation should definitely be solved in RAN3. Maybe except from the current correction in the CR[1], a cause value is also needed in the LOCATION REPORTING FAILURE INDICATION, to notify that about the unmatched reporting type and area of interest. |
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If RAN3 is to clarify the handling of area of interest in the RAN side, there are two kinds of corrections on 38.413 proposed in [1]:

**- Option 1:** modify the procedure text in section 8.12.1.2

If the *Area Of Interest List* IE is included in the *Location Reporting Request Type* IE in the LOCATION REPORTING CONTROL message, and if the *Event Type* IE in the *Location Reporting Request Type* IE is set to ‘UE presence in the area of interest’, the NG-RAN node shall store this information and use it to track the UE's presence in the area of interest as defined in TS 23.502 [10].

**- Option 2:** add a semantic description for area of interest List IE in section 9.3.1.65

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| **Area of Interest List** |  | *0..1* |  | This IE only applies when the Event Type IE is set to ‘UE presence in the area of interest’. | - |  |

**Q3: Which option above do you prefer?**

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| --- | --- | --- |
| Company | Opt | Comments |
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**Q4: Please provide here if you have any other suggestions on the corrections for NGAP.**

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| Company | Comments |
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# **4 Conclusion, Recommendations**

See section 2.

# **5 References**

1. R3-224884, Correction on Location reporting control (NGAP) (ZTE, Huawei, CATT, Samsung)