3GPP TSG-RAN WG3 #115-e R3-222434  
Online, 21 Feb - 3 Mar 2022

Agenda Item: 19.2.2

Source: Samsung (moderator)

Title: CB: # 1902\_Pos\_RRC\_INACTIVE

Document for: Discussion

# Introduction

**CB: # 1903\_Pos\_RRC\_INACTIVE**

**- Need to generalize the UE Reporting Information into a LMF Assistance Information? If yes, what should be included in it?**

**- Assuming the UE Reporting Information remains as defined so far, what information to include in it and how to encode it?**

**- E.g. should it include validity area, validity time, area based, motion based etc.?**

**- Any agreements that can be taken for different use cases of anchor relocation? Should any use case be postponed?**

**- Converge on details on the mechanism for SRS reservation/releasing over F1. Need to check with RAN2?**

**- Should the Xn: Retrieve UE Context procedure be enhanced? E.g. addition of location event indications, NRPPa Transaction ID, History SRS configuration etc**

**- Capture agreements and provide TPs**

(Samsung - moderator)

The plan is the following:

* Phase 1, try to achieve agreements, the deadline for phase 1 is **the end of Thursday Feb 24th**
* Phase 2, try to converge the agreement and TP work.

# For the Chair’s Notes

TBD

# Round-2 Discussion

TBD

# Round-1 Discussion

## Assistance information from LMF to gNB

**Information for CG-SDT configuration**

RAN3 114bis-e meeting, it was agreed **to include UE reporting information in POSITIONING INFORMATION REQUEST message.** The leftover issues are

* Q1, whether to consider area event and motion event in UE reporting information
* Q1bis, how to define the IE type of Reporting Amount/Interval IEs

**[2], Qualcomm: 🡪 Q1: Yes, Q1bis: use LCS format**

Proposal 3: The "LMF assistance information" from the LMF to the gNB should include information on the UE configured event type.

Proposal 4: The "LMF assistance information" from the LMF to the gNB should include the reporting information "Reporting Amount", "Reporting Interval", and "Duration" dependent on the configured event type and as specified in TS 24.080 [4].

**[3], Huawei 🡪 Q1: Yes, Q1bis: use LCS format**

**Proposal 1:** Use reporting Duration and Interval from TS24.080 in UE Reporting Information IE.

**[5], Ericsson 🡪 Q1: No, Q1bis: use LPP format**

**Proposal 1:** The encoding of the UE Reporting Information IE follows LPP format

**[7], Samsung 🡪 Q1: No**

**Proposal 1:** RAN3 agrees not to consider area based and motion based in UE reporting information in R17.

According to the discussions in the contributions [2], [3], [5] and [7], it is the moderator’s understanding that all companies acknowledge that UE reporting information can be used for gNB to allocate proper CG-SDT resources for a positioning UE, but companies have different views on the usage scenario of UE reporting information, i.e. whether it’s for LCS message or LPP message.

Regarding other proposals like the name of the IE and the descriptions proposed by [2], they can be revisited after the 1st round discussion. Please note that the references for LCS message and LPP message are in the Annex if companies want to further check the detail IEs.

**Q1, which message do you think the UE reporting information is for? If it’s for LCS message, should the “duration” IE be introduced for area event and motion event in UE reporting information IE?**

|  |  |  |
| --- | --- | --- |
| Company | LCS message or LPP message | Comment |
| Samsung | LPP message | We share similar view with the argument in [5]. The SDT is for temporary transmission, but the deferred location event may be for the next hours or days, UE may be not in RRC\_INACTIVE state at that moment, it seems the UE reporting information is useless in that case. For the LPP messages which will be transmitted after each location event if positioning is needed, the LMF can use this UE reporting information to indicate the gNB that there will be subsequent positioning procedures and please prepare the resources accordingly. If there’s no LPP messages for one location event, the LMF will not send this information.  Besides, after checking the LCS specs, we haven’t found any proper IE to indicate the actual reporting time for area event and motion event.  The *“duration” is* ***maximum duration*** *of event reporting by a UE*(refer to Annex A), but it’s not the actual reporting time, which should depend on the UE’s movement behavior and criteria sent by the network, so we don’t think this duration IE is a good reference for CG-SDT configuration. |
| HW | Depend on the CG periodicity | We have consensus on the fact that the UE reporting information is used for configure CG. Then whether the CG is used for event report or LPP measurement report. We think technically both might be possible and **it depend on the periodicity of the CG,** which is still under discussion in SDT WI. A short periodicity is definitely more suitable for LPP measurement report and a long periodicity also work for periodic event report.  So we previously had the preference of LPP periodicity but we think we should have a look the periodicity of the CG. |
| CATT | LPP message | Share the view with SS. |
| Ericsson | LPP message | SDT is regarded as a temporary situation for the UE, so the LPP periodicity is enough to carry this purpose (we do not need days…).  Also, our understanding is that RAN2 has thoroughly discussed the proposals in [2] on LMF assistance information and were rejected… |
| Qualcomm | LCS message | LPP periodic reporting can only be used between UE and LMF. This is not supported in the CN for providing periodic services to an LCS client. Therefore, in practice, if periodic or triggered reporting is desired (i.e., by an LCS client) only the LCS reporting criteria are applicable. How useful these criteria are for CG is a separate question. We think this information provided to a gNB is primarily (or even only) useful to assist a gNB to transition the UE to RRC\_INACTIVE. We can't see how this can be reliably used for CG, since there is too much uncertainty in when the UE reports (i.e., the UE will not report exactly on e.g., slot or frame boundaries, but e.g., +/- delta seconds). |
|  |  |  |
|  |  |  |

**Other information or scenario of assistance information.**

Below are some other proposals related to assistance information from LMF in [2], [3] and [5].

**[2], Qualcomm: assistance information can be used for gNB to decide UE state**

Proposal 2: The "LMF assistance information" from an LMF to the gNB from Proposal 1 should comprise all information which can assist the gNB to decide on whether to transit the UE to RRC\_INACTIVE state or not.

**[3], Huawei 🡪 Suggested State from LMF to gNB**

**Proposal 2**: LMF to include the assistance information (eg. Suggested State) in Positioning Information Request message to suggest the gNB-CU to release the UE into RRC Inactive state.

**[5], Ericsson 🡪 Validity area and validity timer for pre-configured SRS**

**Proposal 2:** Introduce a validity area and validity timer for the positioning related configuration in RRC\_INACTIVE in the UE Reporting Information IE.

Based on the above proposals, please answer the following question.

**Q2, do companies agree below enhancements about the assistance information from LMF to gNB?**

* **1) Add descriptions like “when the UE reporting information in included, the serving NG-RAN node can take into account to decide the UE state”**
* **2) include suggested state in Positioning information request from LMF.**
* **3) include Validity area and validity timer information in UE reporting information.**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | For 1), we think UE reporting information can be used for gNB to decide UE state, so we agree to add the related descriptions as suggested by [2].  For 2), more clarification is needed, such as does LMF have any advantage or any additional information to suggest the UE state, comparing to the serving gNB, so that this suggested state from LMF is necessary.  For 3), RAN2 had already precluded the pre-configured SRS in the last meeting, so there’s no need to introduce the validity area and validity timer. |
| HW | 1. We think assistance information is for CG configuration. We should not extend the usage. Last meeting we have agreed to remove the corresponding description. 2. Note that UE in inactive positioning has different capabilities from that in Connected, which may lead to different accuracy/latency/power consumption. The suggestion of stage is more like the LMF to choose the R16 positioning (Connected state) or R17 positioning (Inactive state) to achieve the positioning with different KPI, such as accuracy, latency, power consumption. If there is not such kind of suggestion, the serving gNB would always go with R17 way to try to release the UE into Inactive. 3. Agree with Samsung. no need. |
| CATT | For 1), the intension to introduce the assistance info from LMF to gNB is to assist gNB to decide UE state.  For 2), we do not see why and how the LMF suggest the RRC state. It’s totally decided by the gNB.  For 3), Share the view with SS and HW, it’s not needed. |
| Ericsson | 1) Disagree. As Huawei said, this is uniquely for CG configuration as discussed during last e-meeting.  2) RRC state is not exposed to LMF, that was RAN2 agreement. Also, it could be that the UE is already in RRC Inactive…any UL LCS or LPP msg can be carried using SDT; so from LMF perspective it cannot for sure know what is the UE RRC state.  3) Ok to follow the majority. |
| Qualcomm | We consider (1) and (3) being indirect assistance for assisting the gNB on RRC state. However, a direct request would be preferred, and therefore, we support (2).  (1) and (3) belong together, because (3) is also reporting information. So our 1st preference is (2). 2nd preference is (1) and (3). |
|  |  |
|  |  |

## SRS Reservation and release

**SRS reservation**

In RAN3 114bis-e meeting, it was agreed **to Send an indication (e.g. Reserve SRS) IE from gNB-CU to gNB-DU over F1AP to reserve the SRS configuration in DU for RRC\_INACTIVE UE positioning, FFS on the details.** From the contributions, there’re two options on the messages to include the SRS reservation indication.

- option 1 POSITIOING INFOMRAITION REQUEST message

- option 2 RRC CONTEXT RELEASE COMMAND message.

**[3], Huawei 🡪 option 1 and option 2**

**Proposal 4:** Include an indication (e.g. Reserve SRS) either in POSITIOING INFOMRAITION REQUEST message, or RRC CONTEXT RELEASE COMMAND message.

**[5], Ericsson 🡪 option 2**

**Proposal 3:** The gNB-CU sends an indication Reserve SRS for positioning IE to gNB-DU for reservation of the UL SRS positioning resources in RRC INACTIVE state using the F1 UE CONTEXT RELEASE COMMAND message. FFS on the procedural text and IE encoding pending on RAN3 progress on CG-SDT in AI 24.3

**[7], Samsung 🡪 option 2**

**Proposal 6** RAN3 agrees include the positioning context reservation indication in UE CONTEXT RELEASE COMMAND message.

**Q3, which option do companies agree to support the reservation of the SRS resource on gNB-DU?**

* **Option 1, include positioning context reservation indication in POSITIOING INFOMRAITION REQUEST message**
* **Option 2, include positioning context reservation indication in RRC CONTEXTT RELEASE COMMAND message**

|  |  |  |
| --- | --- | --- |
| Company | Option 1/2 | Comment |
| Samsung | Option 2 | We think it’s better to follow the SDT mechanism, RRC Context Release command is the best choice, including the indication in any other messages before the final release may lead to useless information. |
| HW | Either | We have the preference of using the positioning procedure.  We are OK if majority selecting Option 2. |
| CATT | Option 2 | Better to align with SDT. |
| Ericsson | Option 2 | Both can work, but we expect that before implementing the F1 Positioning functions, a split gNB will support the mechanism for UE context reservation via the UE CONTEXT RELEASE COMMAND message. This reduces the implementation efforts for F1 development engineers. |
|  |  |  |
|  |  |  |
|  |  |  |

**SRS release**

Regarding how to release the reserved SRS, majority of companies prefer no specification impact, but as analyzed in [7], reusing positioning deactivation procedure is only valid for the scenario when UE resumes to a new cell, both UE and gNB can release the SRS resources accordingly. But for the scenario when the positioning is end but UE is still within the anchor cell, if the gNB release the SRS resource via positioning deactivation, how the UE get the SRS deactivation is still on RAN2’s discussion. But no matter how, as argued in [3], to avoid UL interference, the SRS configuration should be released at the same time both in gNB and UE.

**[3], Huawei 🡪 reuse Positioning Deactivation**

**Proposal 5:** Do not define SRS release condition at the gNB-DU; use the Positioning Deactivation to release the SRS.

**[4], CATT 🡪 reuse Positioning Deactivation**

**Proposal 3**: Positioning Deactivation procedure could be reused to release the SRS resources in the gNB-DU, no further enhancement is necessary.

**[5], CMCC 🡪 network implementation**

**Proposal 3:** Release occasion is based on network implementation of gNB-DU and do not introduce any pre-configured conditions or new releasing the positioning context IE over F1 interface.

**[7], Samsung 🡪 check RAN2’s progress**

**Proposal 7:** RAN3 checks RAN2’s progress on how to release the SRS configuration both in gNB and UE during the RAN3 115e meeting.

Based on the above discussion, the moderator formulates below proposals.

**Q4, do companies agree with below proposals on how to release the reserved SRS?**

* **Proposal 1, releasing the SRS configuration both in gNB and UE side at the same time should be ensured in order to avoid UL reference.**
* **Proposal 2, RAN3 agrees to reuse positioning deactivation to release SRS configuration when UE resumes to a new cell/gNB, i.e. the anchor gNB receives Retrieve UE Context Request from other gNBs.**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | Yes. |
| HW | Yes. |
| CATT | Yes |
| Ericsson | Yes |
| Qualcomm | Yes |
|  |  |
|  |  |

## Positioning impact on Xn

**Positioning context related**

RAN3 114bis-e meeting, RAN3 agreed to **Include Routing ID and Requested SRS transmission characteristics in RETRIEVE UE CONTEXT RESPONSE message over XnAP, other information is FFS.** In contribution [7] and [10], it is proposed to include *NRPPa Transaction ID* in the RETRIEVE UE CONTEXT RESPONSE message so that the new serving gNB can send include the NRPPa Transaction ID in the NRPPa messages sent to LMF to let the LMF knows which Transaction this message belongs. In addition, [7] also proposed to include the *History SRS configuration* which can help the new serving gNB allocate a more proper SRS resources. In addition, contribution [6] proposed to include *an explicit IE for indicating location event* is introduced within Retrieve UE Context Request message.

**Q5, do companies agree with below enchantments for UE context procedures?**

* **1), include an explicit IE for indicating location event within RETRIEVE UE CONTEXT RESPONSE REQUEST message.**
* **2), include NRPPa Transaction ID in RETRIEVE UE CONTEXT RESPONSE message, to make sure LMF knows the same transaction (i.e. the same positioning UE).**
* **3), include History SRS in RETRIEVE UE CONTEXT RESPONSE message, to help gNB configure SRS.**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | We see benefits on the bullet 1), but it may be discussed in RAN2 firstly, maybe we can check RAN2’s progress during the meeting and further discuss this in the 2nd round.  Bullet 2) is definitely needed, otherwise the LMF cannot know the message from the new serving gNB belongs to which transaction, the positioning procedure cannot go on without this information.  Bullet 3) is beneficial. The Requested SRS transmission characteristics from LMF are kind of recommendations, the serving gNB may not configure the SRS the same as recommended from LMF according to the actual radio conditions of the UE, so we feel like the SRS configuration (if any) of the last serving cell would be more close to the real situation of the UE. |
| HW | 1. No. The event report is encapsulated in the NAS message. The serving gNB has no chance to know what information is included in the NAS message during the SDT procedure. It is impossible. 2. OK for transaction ID. 3. No need. The SRS is requested by the LMF, rather than the old gNB. So the Requested SRS transmission characteristics IE is enough. **More importantly, the SRS may be not available in the old gNB**, because the old gNB may not be engaged in a UL positioning before. Normally the SRS is encapsulated in the *CellGroupConfig* IE and is transparent to the CU. The SRS is only available at the CU if there was a UL positioning or UL+DL positioning at the old gNB. |
| CATT | 1. No, same view with HW. 2. Ok for transaction ID. 3. History SRS configuration is not essential for the target gNB. |
| Ericsson | Disagree on all.  1) same view as Hw.  2) Hope we are not mixing between Transaction IDs and Measurement IDs. A Transaction ID is a pure protocol-level concept that has nothing to do with measurements or the semantics of what is carried. Whenever a new procedure instance is used, the transaction ID in that AP will be different. Also, our understanding is that Transaction IDs are **only used for non UE associated procedures and not for Class 2** (despite that some Class 2 procedures in NRPPa have it, which was a mistake...)  3) the new gNB will re-configure the UE SRS transmission anew, depending on LMF’s request and the gNB’s local radio conditions; it can totally disregard this history info. This is not needed. |
|  |  |
|  |  |
|  |  |

**In case of without anchor relocation**

In the last RAN3 114bis-e meeting, RAN3 had below open issue to be further discussed.

The case of without anchor relocation for RRC\_INACTIVE UE positioning. (e.g. identify the issues or possible enhancement) based on the progress of SDT WI.

And the following are the related proposals from companies.

**[3], Huawei 🡪 postpone the discussion**

**Proposal 3:** Postpone the discussion of supporting the case of without anchor relocation for the UL and UL+DL positoining, either in Rel-18, or at least after the SDT discussion is complete.

**[4], CATT 🡪 introduce NRPPa container over Xn**

**Proposal 1:** RAN3 is request to discuss which option to go on handling of the UE specific DL NRPPa message during SDT or in normal inactive state.

- Option 1: the anchor fails the NRPPa procedure with proper cause value and relocates the UE context to the new gNB.

- Option 2: the anchor gNB forwards the received NRPPa PDU and corresponding routing ID to the new gNB, the new gNB handles the NRPPa message and responses the LMF accordingly.

Proposal 2: Discuss and agree the TP for Xn, if decide to transfer the received DL NRPPa message in the Xn (option 2).

**[5], CMCC 🡪 fail the positioning procedure in case of without anchor relocation**

**Proposal 2:** Support to introduce the NRPPa failure message from anchor gNB to LMF if without anchor relocation.

**[7], Samsung 🡪 introduce NRPPa PDU transfer message over Xn**

**Proposal 3:** RAN3 agrees to introduce a new Xn message (e.g. NRPPa Transfer) including NRPPa PDU to deliver the NRPPa message between the new serving cell and LMF in case of SDT without anchor relocation.

There’re four companies discussed this open issue. Although two companies showed their concerns on the impact that may depend on SDT and the limited time left for R17 in [3] and [5], two companies had already proposed solutions for the case without anchor relocation. It’s the moderator’s understanding that SDT is only responsible for the delivery of the messages over SRB, the transmission of NRPPa during on-going SDT should be discussed in Positioning WI. Since we already have solutions on the table, it’s no harm to have a try, and below figure is for the reference.



**Q6, which option can be used to support positioning information exchange in case of without anchor relocation?**

* **Option 1, introduce NRPPa PDU over Xn**
* **Option 2, send NRPPa failure message in case of without anchor relocation**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | Option 1.  If option 2 is used, it means that the RRC INACTIVE positioning cannot be supported. |
| HW | If we complete this in R17, we strongly have the preference of include explicit IE in the newly defined “Partial UE Context Retrieve procedure” in SDT WI.  Note that the SRS configuration has to be explicitly included in the response message, so we should use explicit IEs. We can simply include the previously defined “Positioning Information” IEs: 9.1.1.xx PARTIAL UE CONTEXT RETRIEVE REQUEST This message is sent by the old NG-RAN node to transfer part of the UE Context to the new NG-RAN node.  Direction: old NG-RAN node → new NG-RAN node.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality | | Message Type | M |  | 9.2.3.1 |  | YES | reject | | New NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the new NG-RAN node. | YES | ignore | | Old NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the old NG-RAN node. | YES | ignore | | Partial UE Context Information for SDT | O |  | 9.2.3.y |  | YES | ignore | | Positioning Information | O |  | 9.2.3.x |  |  |  |  9.1.1.yy PARTIAL UE CONTEXT RETRIEVE RESPONSE This message is sent by the new NG-RAN node to acknowledge the retrieval of part of the UE context from the old NG-RAN node. This message is also used to provide data forwarding related information for NR SDT or positioning.  Direction: new NG-RAN node → old NG-RAN node.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality | | Message Type | M |  | 9.2.3.1 |  | YES | reject | | New NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the new NG-RAN node | YES | ignore | | Old NG-RAN node UE XnAP ID reference | M |  | NG-RAN node UE XnAP ID 9.2.3.16 | Allocated at the old NG-RAN node | YES | ignore | | **SDT Data Forwarding DRB List** |  | *0..1* |  |  | YES | ignore | | **>SDT Data Forwarding DRB Item** |  | *1..<maxnoofDRBs>* |  |  |  |  | | >>DRB ID | M |  | 9.2.3.33 |  |  |  | | >>DL TNL Information | O |  | UP Transport Layer Information 9.2.3.30 |  |  |  | | SRS configuration | O |  |  |  |  |  |  |  |  | | --- | --- | | Range bound | Explanation | | maxnoofDRBs | Maximum no. of DRBs. Value is 32. | |
| CATT | We do not expect to proceed with the DL NRPPa as the figure shown above.  In [4], we think the handling of UE specific DL NRPPa message received in the anchor during SDT could be aligned with non-SDT handling during SDT. Anchor gNB could release the UE and re-initiate another RRC Resume procedure for the DL NRPPa handling, then anchor gNB may relocate the UE context together with the NRPPa PDU, the new gNB becomes the new anchor and handles the NRPPa PDU accordingly.  Another way is just to go for the option 1 in Rel-17, just like the handling of DL NAS PDU in RRC\_INACTIVE.  Which means option 1 is feasible, and we should not say without NRPPa-PDU transfer over Xn, the Positioning in Inactive is not supported. As the ongoing SDT procedure is being used for positioning report in Inactive, we understand the DL NRPPa message is not tightly related to the Inactive positioning, which means the DL NRPPa message will not always come during SDT.  Maybe we could consider the option 1 in Rel-17. |
| Ericsson | We must not add “specification impacts” on top of something that is currently being specified (and that is already quite controversial in the corresponding WI). In our opinion, this is not a correct way of working in 3GPP (e.g., how would TPs be handled if we impact procedures in the BL CR of another WI? How would stage 2/3 modifications be handled across different WIs??).  Since this is the last e-meeting of the Release, we strongly suggest taking the case of positioning with SDT without anchor relocation for Rel-18, once the SDT XnAP design has been stabilized. |
|  |  |
|  |  |
|  |  |

As analyzed in [3] and [7], if the NRPPa message relates to UL positioning, the SRS configuration should be transmitted from the serving gNB to the anchor gNB to assemble the RRC release message to include the SRS configuration.



**Q7, do companies agree to include SRS configuration as an explicit IE over XnAP so that the anchor gNB can assemble the RRC Release message?**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | Yes |
| Huawei | Yes if we complete this in R17. See comments in Q6. |
| CATT | It seems this is the special case of Q5, where the DL NRPPa message received in the anchor gNB is SRS related.  For this case, If we try to do something in Rel-17, maybe we could consider HW’s proposal as been provided in the comments to Q6. |
| Ericsson | How can the Retrieve UE Context Failure be triggered at step 11? This is not a Class 2 procedure?  The stage 2 framework requires more analysis. We strongly suggest to consider positioning in SDT w/o anchor relocation in R18. |
|  |  |
|  |  |
|  |  |

**NRPPa failure message**

In contribution [10], it is proposed to let the new serving gNB send the NRPPa failure message including the new cause value to LMF to trigger the retransmission of NRPPa message

**Q8, do companies agree with the above proposal?**

|  |  |
| --- | --- |
| Company | Comment |
| Samsung | Our understanding is that the anchor gNB that receives the NRPPa request should send the failure message to LMF, after the path switch, the AMF will notify the LMF UE moves to a new serving gNB, the LMF can retransmit the NRPPa request message to the new serving gNB. |
| HW | We don’t think the failure message of a class 1 procedure can be sent from a different node. |
| CATT | Actually, the [10] discussed how to handle the DL NRPPa for a UE in RRC Inactive, not for SDT case.  Handling of NAS-PDU in Inactive could be taken as reference, i.e. anchor gNB could send the failure message towards the LMF. After Path switch, LMG may re-initiate the DL NRPPa procedure towards the new serving gNB. |
| Ericsson | This needs more thoughts and discussion. We strongly suggest to consider positioning in SDT w/o anchor relocation in R18. |
|  |  |
|  |  |
|  |  |

## Others

There’s an LS [1] on the DRX cycle used in PRS measurement from RAN4, but there’s no discussion about the LS in the contributions. If companies have any view or way forward on the LS, please provide your comment.

|  |  |
| --- | --- |
| Company | Comment |
| Qualcomm | This means that the UE response time can be different in different RRC states, and therefore an LMF would need to take this into account when requesting location information from a UE. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Conclusion

# References

|  |  |  |  |
| --- | --- | --- | --- |
| **[1]** | [R3-221659](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-221659.zip) | LS on DRX cycle used in PRS measurement in RRC\_INACTIVE state (RAN4) | LS in |
| **[2]** | [R3-221747](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-221747.zip) | (TP for NRPPa baseline) LMF Assistance Information to support positioning in RRC\_INACTIVE state (Qualcomm Incorporated) | Other |
| **[3]** | [R3-221881](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-221881.zip) | (TP for POS BL CR for TS 38.455, TS 38.473) on RRC\_INACTIVE positioning (Huawei) | other |
| **[4]** | [R3-221893](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-221893.zip) | (TP for Positioning BL CR 38.423) Positioning support in Inactive (CATT) | other |
| **[5]** | [R3-221948](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-221948.zip) | (TP for NRPPa BL CR on Positioning) Completion of RRC\_INACTIVE assistance data for positioning (Ericsson) | other |
| **[6]** | [R3-222257](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-222257.zip) | Discussion on RRC INACTIVE State Positioning (CMCC) | Discussion |
| **[7]** | [R3-222285](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-222285.zip) | Positioning in RRC inactive state (Samsung) | discussion |
| **[8]** | [R3-222286](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-222286.zip) | (TP for BL CR TS38.423) RRC Inactive positioning (Samsung) | other |
| **[9]** | [R3-222287](file:///C:/Users/lisi.li/AppData/Roaming/Microsoft/Word/draft%20R3-22xxxx%20SOD%20of%20CB%20%2523%201902_Pos309423502324735498/Docs/R3-222287.zip) | (TP for BL CR TS38.473) RRC Inactive positioning (Samsung) | other |
| **[10]** | [R3-222342](file:///D:/RAN3%20115e/Docs/R3-222342.zip) | Discussion on RRC\_INACTIVE state Positioning (VIVO TECH GmbH) | Discussion |

# Annex A (LCS message, TS24.008, TS 29.002)

LCS-PeriodicTriggeredInvokeArg ::= SEQUENCE {

referenceNumber [0] LCS-ReferenceNumber,

h-gmlc-address [1] GSN-Address,

qoS [2] LCS-QoS OPTIONAL,

reportingPLMNList [3] ReportingPLMNList OPTIONAL,

periodicLocation [4] PeriodicLocation OPTIONAL,

areaEventReporting [5] AreaEventReporting OPTIONAL,

motionEventReporting [6] MotionEventReporting OPTIONAL,

PeriodicLocation ::= SEQUENCE {

periodicLDRInfo [0] PeriodicLDRInfo,

... }

**PeriodicLDRInfo** ::= SEQUENCE {

reportingAmount ReportingAmount,

reportingInterval ReportingInterval,

...}

-- reportingInterval x reportingAmount shall not exceed 8639999 (99 days, 23 hours,

-- 59 minutes and 59 seconds) for compatibility with OMA MLP and RLP

**ReportingAmount** ::= INTEGER (1..maxReportingAmount)

**maxReportingAmount** INTEGER ::= 8639999

**ReportingInterval** ::= INTEGER (1..maxReportingInterval)

-- ReportingInterval is in seconds

**maxReportingInterval** INTEGER ::= 8639999

AreaEventReporting ::= SEQUENCE {

deferredLocationEventType [0] DeferredLocationEventType,

areaList [1] AreaList,

occurrenceInfo [2] OccurrenceInfo OPTIONAL,

intervalTime [3] IntervalTime OPTIONAL,

maximumInterval [4] MaximumInterval OPTIONAL,

samplingInterval [5] SamplingInterval OPTIONAL,

duration [6] Duration OPTIONAL,

locationInfo [7] LocationInfo OPTIONAL,

... }

OccurrenceInfo ::= ENUMERATED {

oneTimeEvent (0),

multipleTimeEvent (1),

...}

IntervalTime ::= INTEGER (1..32767)

*-- minimum interval time between area reports in seconds*

MaximumInterval ::= INTEGER (1..86400)

-- maximum time interval between consecutive event reports in seconds.

SamplingInterval ::= INTEGER (1..3600)

-- maximum time interval between consecutive evaluations by a UE of a trigger event,

-- in seconds.

Duration ::= INTEGER (1..8640000)

-- maximum duration of event reporting by a UE, in seconds

# Annex B (LPP message, TS 37.355)

*CommonIEsRequestLocationInformation*

The *CommonIEsRequestLocationInformation* carries common IEs for a Request Location Information LPP message Type.

-- ASN1START

CommonIEsRequestLocationInformation ::= SEQUENCE {

locationInformationType LocationInformationType,

triggeredReporting TriggeredReportingCriteria OPTIONAL, -- Cond ECID

periodicalReporting PeriodicalReportingCriteria OPTIONAL, -- Need ON

additionalInformation AdditionalInformation OPTIONAL, -- Need ON

qos QoS OPTIONAL, -- Need ON

environment Environment OPTIONAL, -- Need ON

locationCoordinateTypes LocationCoordinateTypes OPTIONAL, -- Need ON

velocityTypes VelocityTypes OPTIONAL, -- Need ON

...,

[[

messageSizeLimitNB-r14 MessageSizeLimitNB-r14 OPTIONAL -- Need ON

]],

[[

segmentationInfo-r14 SegmentationInfo-r14 OPTIONAL -- Need ON

]]

}

...

PeriodicalReportingCriteria ::= SEQUENCE {

reportingAmount ENUMERATED {

ra1, ra2, ra4, ra8, ra16, ra32,

ra64, ra-Infinity

} DEFAULT ra-Infinity,

reportingInterval ENUMERATED {

noPeriodicalReporting, ri0-25,

ri0-5, ri1, ri2, ri4, ri8, ri16, ri32, ri64

}

}