**3GPP T****SG-RAN WG2 Meeting #114-e R2-2106447**

**Electronic, 19th – 27th May, 2021**

**Agenda item: 8.11.3**

**Source: Huawei, HiSilicon (Rapporteur of Summary)**

**Title: Summary of AI 8.11.3 for INACTIVE POS**

**Document for: Discussion and Decision**

# 1 Introduction

For RAN2#114-e, the following contributions have been submitted for INACTIVE POS.

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| RefCode | TdocNum | Title | Source |
| 4802, CATT | R2-2104802 | Positioning for UEs in RRC\_INACTIVE state | CATT |
| 5216, HW | R2-2105216 | Discussion on positioning in RRC INACTIVE state | Huawei, HiSilicon |
| 5222, HW | R2-2105222 | Draft LS to SA2 on INACTIVE positioning | Huawei, HiSilicon |
| 5303, IDC | R2-2105303 | Discussion on Positioning in RRC INACTIVE state | InterDigital, Inc. |
| 5304, IDC | R2-2105304 | Discussion on Positioning Information reporting using SDT | InterDigital, Inc. |
| 5309, IDC | R2-2105309 | Discussion on Positioning during Mobility in RRC\_INACTIVE | InterDigital, Inc. |
| 5339, OPPO | R2-2105339 | Supporting positioning in RRC\_INACTIVE state | OPPO |
| 5340, OPPO | R2-2105340 | Discussion on UL Positioning methods in RRC\_INACTIVE state | OPPO |
| 5546, Spreadtrum | R2-2105546 | Discussion on positioning in RRC\_INACTIVE state | Spreadtrum Communications |
| 5561, XIAOMI | R2-2105561 | Discussion on positioning for UEs in RRC Inactive | Xiaomi |
| 5601, LEN | R2-2105601 | On Positioning in RRC\_INACTIVE state | Lenovo, Motorola Mobility |
| 5703, SONY | R2-2105703 | Considerations on positioning RRC Inactive | Sony |
| 5710, FRAUN | R2-2105710 | Considerations on Assistance data for positioning in RRC\_INACTIVE mode. | Fraunhofer IIS; Fraunhofer HHI |
| 5971, ERI | R2-2105971 | On Maximizing benefits of SDT | Ericsson |
| 6083, QC | R2-2106083 | Positioning of UEs in RRC Inactive State | Qualcomm Incorporated |
| 6104, INTEL | R2-2106104 | Support of UL and RAT independent positioning in RRC\_INACTIVE | Intel Corporation |
| 6369, SAM | R2-2106369 | Support of positioning result reporting in Inactive state | Samsung Electronics |
| 6408, VIVO | R2-2106408 | Discussion on UL positioning support in RRC\_INACTIVE state | vivo |
| 6409, VIVO | R2-2106409 | Discussion on open issues of positioning support in RRC\_INACTIVE state | vivo |
| 6429, ZTE | R2-2106429 | Discussion on DL INACTIVE positioning | ZTE Corporation, Sanechips |
| 6430, ZTE | R2-2106430 | Discussion on MG for INACTIVE positioning | ZTE Corporation, Sanechips |
| 6434, INTELetAL | R2-2106434 | Support of Positioning in RRC\_INACTIVE | Intel Corporation, Apple, OPPO, Xiaomi, InterDigital Inc., Spreadtrum, CATT, Huawei, HiSilicon, ZTE, vivo, Convida Wireless, Nokia |

In this contribution, we summarize all the above contributions regarding INACTIVE POS.

In addition, in R2-2104921, the WI rapporteur has given some general guidance on the scope of WID, for which we have also taken into account in the summary of the INACTIVE POS Agenda Item.

# 2 Downlink Positioning

With R2-21064634, referred as the “joint contribution” in the below, multiple sources have proposed a joint contribution for addressing the issues with positioning in RRC\_INACTIVE.

## 2.1 Transport of UL POS message

In last RAN2 meeting, RAN2 agreed the working assumption

WA: Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective, subject to the data volume supported by AS layers. I.e. RAN2 do not specify a restriction on message type.

FFS if LPP needs to select transport, i.e. if the message is just submitted to lower layers which decide how to deliver it (SDT, change state, etc.).

The following proposals have been proposed by different companies for RAN2#114e

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| [6434, INTELetAL] has proposed the following to confirm on the above working assumption.  **Proposal 1: To confirm working assumption that any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective, subject to the data volume configured for SDT, i.e., RAN2 does not specify a restriction on message type.**  In addition, such confirmation has also been proposed in the following contributions:  [5304, IDC]  Proposal 1: Confirm working assumption as agreement that any uplink LCS or LPP messages (e.g. ProvideLocationInformation) can be transported in RRC\_INACTIVE from RAN2 perspective, subject to the data volume supported by AS layers  [5339, OPPO]  Proposal 1 RAN2 confirm the working assumption that any uplink LCS or LPP message can be transported in RRC\_INACTIVE state.  [5561, XIAOMI]  Proposal 1: Confirm the working assumption that any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective, subject to the data volume supported by AS layers.  [6409, VIVO]  Proposal 1: From RAN2 perspective, UL LCS messages and LPP messages (in addition to ProvideLocationInformation) can be transferred in RRC\_INACTIVE via SDT.  Proposal 3: RRC state of UE is invisible to LPP layer and the LPP message is just submitted to lower layers which decide how to deliver it (SDT, transfer to RRC\_CONNECTED, etc.). Therefore, LPP message transmission adoptive to the RRC state is not supported.  [6429, ZTE]  Proposal 1: Both LCS message and LPP message can be transported in RRC\_INACTIVE status via SDT. |

**Rapporteur’s comments:**

From our understanding, there are two aspects for the above proposal from the joint contribution: (a) Any uplink LCS and LPP messages can be transported in RRC\_INACTIVE; (b) The transport of the message is subject to the determination of the lower layer based on the data volume threshold.

Based on the majority of the views, the above point in (a) seems agreeable

***SummaryProposal*: Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective**

On point (b) for the selection of SDT or non-SDT for DL POS and which layer to perform, the following proposals have also been provided by various sources. Discussion has also been provided regarding the relationship between the QoS of the positioning service and the lower layer transport in RRC\_INACTIVE or RRC\_CONNECTED.

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| [5601, LEN]  Proposal 4: Selection and delivery criteria for the of transport of LPP messages can be left to the lower layers and network remains in control of configuring SDT/non-SDT procedures and RRC state changes.  [6369, SAM]  Proposal 1. LPP doesn’t have to select the transport when UE has generated the LPP message to be transmitted in inactive mode.  [5303, IDC]  Proposal 4: Support PRS configurations for UE that ensures the same level of positioning accuracy and can be applied regardless of UE RRC state (i.e., CONNECTED or INACTIVE)  [5304, IDC]  Proposal 2: Support transmission of measurement reports/location estimates with SDT-SRB2 from UE to LMF when in INACTIVE regardless of the positioning accuracy requirement  [6409, VIVO]  Proposal 4: Accuracy requirement is not additional criteria to transfer the positioning message via SDT.  [5339, OPPO]  Proposal 2 It is up to lower layer on how to deliver the corresponding UL LCS/LPP message, i.e. either through SDT or entering RRC connected.  [5561, XIAOMI]  Proposal 2: The LPP don’t need to select transport and RRC state is invisible to LPP and LCS message.  Proposal 3: Whether RRC inactive UE transmits to RRC connected to send or receive LPP message is determined by AS layer mechanism.  [5561, XIAOMI]  Proposal : Whether UE sends location information in RRC inactive or RRC connected is based on SDT mechanism. |

While the following proposed has been proposed for the transport of UL pos message in RRC\_INACITVE

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**Rapporteur’s comments:**

One company has proposed that the LPP layer shall instruct the lower layer to employ which RRC state to transmit the measurement report or the location estimate depending on the configured response time. However, the rapporteur would like to note that the the selection of SDT vs non-SDT also depend on the data volume of the data to be transmitted and the RSRP of the lower layer. Even if the LPP layer instructs the lower layer to send data under which RRC state, it is still up to the decision of the lower layer to decide whether SDT or non-SDT is suitable. Based on the majority of the views from different companies, we propose the following:

***SummaryProposal*: Selection of SDT vs non-SDT is performed by the lower layer for transport of the positioning message for INACTIVE positioning.**

## 2.2 RRC state for the measurement/location estimate report

The following sources have proposed the following for the measurement/location estimate report for INACTIVE positioning:

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| In the joint contribution [6434, INTELetAL], the following has been proposed that  **Proposal 4: RRC state (RRC\_CONNECTED or RRC\_INACTIVE) is transparent to positioning procedure ( LPP/LCS in UE and LMF);**  [5216, HW]  Proposal 3: Support the following cases for PRS measurement and/or location estimate reporting:   * PRS measurement and/or location estimate performed in RRC\_CONNCTED or RRC\_INACTIVE can be sent in RRC\_INACTIVE via SDT.   **[**5304, IDC]  Proposal 6: For UE-based positioning, support transmission of multiple buffered location estimates determined in INACTIVE after transitioning to RRC CONNECTED |

***Rapporteur’s comments:***

On which RRC state, the UE can send location estimate and measurement report to the network, the

***SummaryProposal*: Support the following options for the transport of measurement results and/or location estimate for positioning in RRC\_INACTIVE**

* **Case1: PRS measurement and/or location estimate performed in RRC\_INACTIVE can be sent in RRC\_INACTIVE**
* **Case2: PRS measurement and/or location estimate perform in RRC\_INACTIVE can be sent in RRC\_CONNECTED**
* **Case3: PRS measurement and/or location estimate performed in RRC\_CONNECTED can be sent in RRC\_INACTIVE**

## 2.3 PRS configuration

For the provision of PRS configuration, the following has been proposed for INACTIVE positioning

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| [5216, HW]  Proposal 2: On-demand SI request in RRC\_INACTIVE and assistance data delivery in RRC\_CONNECTED can be reused for DL positioning in RRC\_INACTIVE. No stage3 enhancements are needed.  [5303, IDC]  Proposal 1: Support the use of PRS configuration received during RRC CONNECTED for making PRS measurements when in INACTIVE  [5339, OPPO]  Proposal 5 For positioning in RRC\_INACTIVE state, the positioning assistance data can be delivered to UE in the following ways: a) positioning system information, b) pre-configured when UE in RRC\_CONNECTED state; c) send to UE during ongoing SDT procedure.  [5561, XIAOMI]  Proposal 4: The following options can be considered to configure the positioning assistance data to RRC Inactive UE:   * Option 1: The network broadcasts posSIB * Option 2: The existing deferred MT-LR procedure * Option 3: The existing LPP provide assistance data message with additional indication * Option 4: NRPPa message and RRC release message * Option 5: The existing LPP provide assistance data message sent by SDT   [5710, FRAUN]  Proposal 1: RAN2 shall discuss whether the assistance data structure, content or delivery mechanism for the measurement of DL-PRS during the RRC\_INACTIVE state provided to a UE could differ from that provided for the RRC\_CONNECTED state.  [6429, ZTE]  Proposal 4: It is proposed that RAN2 will re-use the Rel-16 mechanism for positioning configuration in DL INACTIVE positioning. No new mechanism or IE for DL INACTIVE positioning configuration will be introduced in Rel-17(e.g. RRC message for DL INACTIVE positioning measurement configuration).  [**5971, ERI**]  Proposal 5: Support of posSIB retrieval using SDT in Inactive mode is supported. |

**Rapporteur’s comments**

Based on the above proposals, we think that majority of the companies think that mechanism of assistance information delivery for DL positioning in RRC\_CONNECTED can be reused for RRC\_INACTIVE. It can be further discussed whether to add additional information to differentiate the AD used for RRC\_INACTIVE and RRC\_CONNECTED.

***SummaryProposal*: The mechanism for positioning assistance information delivery.**

* **Case1: The network broadcasts posSIB with/without SI request**
* **Case2: Assistance Information delivery during RRC\_CONNECTED**
* **Case3: Assistance Information delivery during RRC\_INACTIVE using SDT in DL**

**FFS whether to add additional information to differentiate the Assistance Information used for RRC\_INACTIVE and RRC\_CONNECTED**

## 2.4 RAT-independent positioning

For RAT-independent positioning, the following has been proposed:

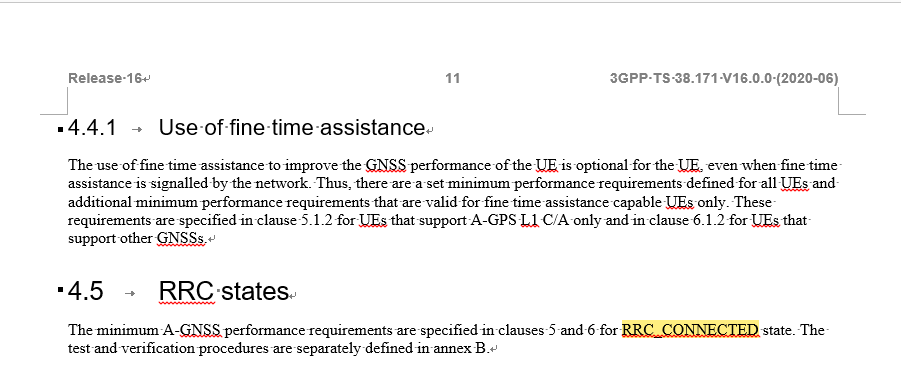
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| [5601, Len]  Proposal 2: Support the following the RAT-independent UE-assisted and UE-based positioning methods in RRC\_INACTIVE state: A-GNSS, Motion Sensor, WLAN, TBS and Bluetooth (UE-assisted).  [6104, INTEL]  Proposal 1: Any agreements of DL positioning in RRC\_INACTIVE are also applied for RAT independent positioning methods in RRC\_INACTIVE.  Proposal 2: All RAT independent positioning methods, including Barometric pressure sensor, WLAN, Bluetooth, TBS, Motion Sensor, A-GNSS, etc can be supported in RRC\_INACTIVE. |

**Rapporteur’s comments:**

For the support of RAT-independent positioning, we have discussed about this during the SI phase and the majority of the companies think we can support this for free if the transport of measurement report or location estimate can be supported for INACTIVE. Thus, it can be proposed that RAT-independent positioning can be supported from RAN2’s perspective.

***SummaryProposal*: All RAT-independent positioning methods in RRC\_INACTIVE can be supported from RAN2’s perspective.**

However, we would like to note that the current RAN4 requirement for GNSS measurement is defined for RRC\_CONNECTED. This can be seen by the following paragraph excerpted from the spec TS 38.171



Hence, for the support of RAT-independent positioning, it should be also confirmed by RAN4 on RAN4’s support for RAT-independent positioning.

***SummaryProposal*: Send an LS to RAN4 on RAN2’s agreement on the support of RAT-Independent positioning.**

## 2.5 DL E-CID

Support for E-CID has been discussed during the SI phase of the R17 positioning. It is proposed to discuss RRM reporting can be supported for UE in RRC\_INACTIVE

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| [5601, Len]  Proposal 1: RAN2 to discuss RRC\_INACTIVE reporting of RRM (NR E-ECID) measurements along with other DL-based positioning methods. |

Based on the above proposal, we think that we can discuss whether DL E-CID can be supported for RRC\_INACTIVE positioning. In symmetry to DL, we can also study whether UL E-CID can also be supported.

***SummaryProposal*: Support DL E-CID for RRC\_INACTIVE positioning. FFS support for UL E-CID**

## 2.6 Support of SDT for INACTIVE positioning

The following proposals have been proposed for the support of INACTIVE POS with SDT

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| **[**5304, IDC]  Proposal 3: Support transmission of an indication from UE to gNB to indicate the size of LPP message (e.g. containing measurement reports/location estimates) for ensuring suitable data volume threshold is configured when using SDT-SRB2  Proposal 4: Support segmentation and transmission of segments of positioning information (i.e. LPP messages with suitable identifiers) over multiple SDT transmissions  Proposal 5: Support configuration of CG for SDT with parameters (e.g. periodicity) aligned with measurement reporting occasions in INACTIVE  [5601, LEN]  Proposal 7: RAN2 supports LPP segmentation of the measurement report for large measurement report size exceeding the data volume threshold size to support SDT transmissions in RRC\_INACTIVE state based on a set of criteria. FFS threshold and segmentation criteria for the measurement report.  Proposal 5: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE, similar to CG-SDT.  [5309, IDC]  Proposal 3: Support sending of measurement reports/location estimates which are aligned with the transmission of RNA updates  Proposal 4: Support configuring of CG that is valid across different cells for sending periodic measurement report/location estimates when in INACTIVE |

**Rapporteur’s comments:**

For the segmentation of LPP message, it has already been supported by the current LPP spec and it is not clear what the required changes to the current spec are.

For the indication from the UE to the gNB on the size of the LPP message, it is still under discussion in the SDT session whether the UE can request CG configuration to the gNB for CG-SDT. Hence, we think this can be discussed under SDT and companies who think the motivation from positioning is very justified can provide inputs to the SDT session.

For sending measurement report during RNA update, the SDT session has also been discussing about the relationship between SDT and RNA update. For this, we think it can be discussed in the SDT session.

In addition, the following proposal has also been given in the WI rapporteur’s tdoc on the clarification of the scope of the WI.

***SummaryProposal*: Support of SDT for positioning can be discussed in SDT session.**

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| [4802, CATT]  Proposal 2: RAN2 discuss whether to introduce assistance info which can be used to assist NG-RAN node to decide to release the UE into RRC\_INACTIVE, and whether to configure SDT for SRB2. The following assistance info from LMF to NG-RAN can be considered:   * whether the UE supports positioning in RRC\_INACTIVE; * Periodicity of UE measurement report. |

**Rapporteur’s comments:**

For the assistance information for the measurement report, we don’t think it is feasible to specify the periodicity of the measurement report for event-triggered differed MT-LR due to its sporadic nature. For the periodicity of Small Data Transmission for configured grant, it is still under discussion whether the UE can request to the network the periodicity of the configured grant. While for positioning, RAN2 can further study whether this is necessary to have the assistance information from LMF to gNB for the periodicity of the report such that proper CG-SDT configuration can be given to the UE. Note that this is also under the assumption that the RRC state of the UE is exposed to the LMF.

***SummaryProposal*: RAN2 to further study whether it is necessary to have the assistance information from LMF to NG-RAN for the periodicity of the periodic deferred MT-LR for CG-SDT with the LMF knowing the RRC state of the UE.**

# 3 Common aspects of UL and DL

## 3.1 General Thinkings

Regarding the relationship between UL and DL positioning in RRC\_INACTIVE, the following proposals have been proposed:

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| [6104, INTEL]  Proposal 3: Any agreements of DL positioning in RRC\_INACTIVE are also applied for UL positioning methods in RRC\_INACTIVE.  [6408, VIVO]  Proposal 1: The conclusions related to SDT in DL positioning can applies to UL positioning as well. |

***Rapporteur comments:***

In general, we agree with the rationale behind the proposal to seek for maximum commonality between UL and DL positioning in RRC\_INACTIVE. Nevertheless, we need to examine the agreements case-by-case on whether they can be applicable for both UL and DL.

***SummaryProposal*: The agreements for DL are also valid for UL, unless it is either obvious that they are not needed for/related to UL or unless it is explicitly stated so.**

## 3.2 Transport of DL POS messages

In this meeting, the following proposals have been proposed for the transport of DL POS message.

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| The joint contribution in [6434, INTELetAL] has proposed the following  **Proposal 2: Follow Rel-17 SDT framework, where the network can send DL LCS, LPP message and RRC message(e.g. to configure SRS (TBD on what message is used), if UL positioning supported) to the UE if the UE initiated data transmission using UL SDT. Otherwise, if UE did not initiate UL SDT, rely on legacy operation, i.e. the network shall transition the UE to RRC\_CONNECTED, e.g. based on RAN paging.**  Furthermore, discussions on the same issue have also been provided by various other sources  [4802, CATT]  Proposal 4: Any DL LCS or LPP message transmission following UL SDT within RRC\_INACTIVE is supported. It is up to NG-RAN implementation whether to transmit subsequent DL LCS or LPP message within RRC\_INACTIVE.  [5971, ERI]  Proposal 3 “Any UL LCS or LPP” message is changed to” Any LCS or LPP message”.  [5303, IDC]  Proposal 2: Support transmission of DL LPP messages (e.g. LPP ProvideAssistanceData and RequestLocationInformation) and LCS messages to UE when in INACTIVE using configured SDT-SRB2  Proposal 6: Support transmission of SRSp configuration (e.g. using SDT) or indication for initiating SRSp transmission to UE when in INACTIVE  [6409, VIVO]  Proposal 2: From RAN2 perspective, DL LCS messages and LPP messages can be transferred in RRC\_INACTIVE when there is ongoing SDT for the UE.  [5703, SONY]  Proposal 5: The positioning configuration for positioning in RRC inactive is obtained when the UE is still in RRC-Connected mode. |

For the transport of downlink message in INACTIVE positioning, we propose the following based on the proposal from the joint contribution:

***SummaryProposal*: Follow Rel-17 SDT framework for INACTIVE UL and DL positioning:**

* **If the UE initiated data transmission using UL SDT, the network can send DL LCS, LPP message and RRC message (e.g. to configure SRS (TBD on what message is used), if UL positioning supported) to the UE.**
* **Otherwise, if UE did not initiate UL SDT, rely on legacy operation, i.e. the network shall transition the UE to RRC\_CONNECTED, e.g. based on RAN paging.**

## 3.3 Visibility of RRC state to LPP

In addition, the following proposals have also been provided by various sources in the contributions that RRC state should not be visible to the LMF:

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| In the joint contribution, the following has been proposed:  [6434, INTELetAL]  **Proposal 3: Same as legacy, the transition to RRC\_INACTIVE is up to network implementation, and it is invisible to the LMF;**  **Proposal 4: RRC state (RRC\_CONNECTED or RRC\_INACTIVE) is transparent to positioning procedure ( LPP/LCS in UE and LMF);**  [5339, OPPO]  Proposal 3 No additional RRC state information is transmitted to LMF.  [5561, XIAOMI]  Proposal 2: The LPP don’t need to select transport and RRC state is invisible to LPP and LCS message.  Proposal 3: Whether RRC inactive UE transmits to RRC connected to send or receive LPP message is determined by AS layer mechanism.  [5216, HW]  Proposal 1: Do not expose the RRC state to LMF.  [6409, VIVO]  Proposal 3: RRC state of UE is invisible to LPP layer and the LPP message is just submitted to lower layers which decide how to deliver it (SDT, transfer to RRC\_CONNECTED, etc.). Therefore, LPP message transmission adoptive to the RRC state is not supported.  [6429, ZTE]  Proposal 2: RRC state is not exposed to LPP. |

The following sources have proposed to expose the RRC state to the LMF

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| **[**5601, LEN]  Proposal 5: RAN2 to support RRC state awareness at the LMF for optimized, efficient, and low latency delivery of LPP messages in either RRC\_CONNECTED or RRC\_INACTIVE states.   * Note: RRC state exposure to LMF does not assume any control by the LMF (LPP) on any RRC state behavior of the UE, selection of transport, etc.   Proposal 6: RAN2 to consider the following signalling support for RRC state awareness at the LMF and send corresponding LS to RAN3/SA2, where applicable:   * Option 1: The LMF can request for state transition notifications directly with NG-RAN using NRPPa messages (requires RAN3 feasibility confirmation). * Option 2: The LMF can request for state transition notifications via the AMF from NG-RAN (requires SA2 feasibility confirmation). * Option 3: The UE can directly feedback the RRC state indication to the LMF (under RAN2 scope).   Note: Options 1 and 2 can be based on operator local configuration (OAM).  Proposal 10: Support UE autonomous RRC release indication for UEs performing RRC\_INACTIVE state positioning. FFS RAN3 impacts to NRPPa.  **[**6083, QC]  Proposal 4: Clarify the agreement from RAN2#113bis as follows:  WA: Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective, subject to the data volume supported by AS layers. I.e. RAN2 do not specify a restriction on message type.  WA: The "positioning function" in the UE as well as an LMF need to be aware of the UE RRC state.  NOTE: The LMF awareness of RRC State may be implicit; e.g., based on the sequence of events/steps performed (i.e., if an LMF foremost has allowed (or supports) positioning in RRC\_INACTIVE), or may be explicit (e.g., an indication in the messages).  **[**6369, SAM]  Proposal 2. By exposing the RRC state of the UE to LPP, LPP can further generate the reduced version of measurement report when UE is in inactive state, which can increase the efficacy of SDT solution.  [5971, ERI]  Proposal 1 LPP Layer in LMF depending upon the QoS need of next periodical measurement report and whether positioning or tracking is needed; provides guidance to device on whether small or large measurement report is required.  Proposal 2 UE LPP layer can instruct the lower layer which RRC mode can be used for transmission depending upon the LMF guidance and configured responseTime.  [5546, Spreadtrum]  Proposal 1: Either RAN2 can optimize the data size of positioning reports or RAN2 can modify the SDT data volume threshold considering the data size of positioning reports in RRC\_INACTIVE state.  Proposal 2: The LMF can adjust configuration for positioning data report to adjust the data size considering the SDT data volume threshold.  Proposal 3: gNB should inform LMF the SDT data volume threshold.  Proposal 4: LMF should indicate gNB the estimated data size of measurement reports or location estimates. |

**Rapporteur’s comments:**

For the contributions from the proponent that the RRC state should be exposed to the LMF, it is still hard to find solid motivation for what will be the use of the RRC state’s exposure to the LMF or the LPP layer of the UE. Based on the majority of the views from the submitted tdocs, we propose the following. We can come back to this if we find issues if RRC state of the UE is not exposed to LMF:

***SummaryProposal*: RRC state of the UE is not exposed to the positioning function in UE and LMF for UL and DL INACTIVE Positioning. This can be revisited/enhanced in future if deemed useful.**

## 3.4 Supported type of location services

On the supported type of location services, the following proposals have been provided by various sources:

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| [5339, OPPO]:  Proposal 4 Deferred location request can be reused for positioning in RRC\_INACTIVE state  [5561, XIAOMI]  Proposal 5: The following options can be considered for sending the request location information message to RRC Inactive UE:   * Option 1: The existing deferred MT-LR procedure * Option 2: RequestLocationInformation with additional indication sent to UE in RRC Connected * Option 3: RequestLocationInformation sent by SDT   [6083, QC]  Proposal 1: Support the low power periodic and triggered 5GC-MT-LR procedures (clause 6.7 of TS 23.273 [3]) using the NR Small Data Transmission (SDT).  Proposal 2: If Proposal 1 can be agreed, send an LS to SA2 informing them about the RAN2 agreement.  [6429, ZTE]  Proposal 3: It is proposed that RAN2 will not discuss what kinds of positioning services should be supported by INACTIVE positioning. |

***Rapporteur’s comments:***

This has been briefly discussed during RAN2#113bis, but no agreements have been made. We also think it is necessary to discuss on the supported types of location services. From the inputs from different sources, we think there can be the following options for the supported services:

* Option1: Support only deferred MT-LR
* Option2: Support both deferred MT-LR and MO-LR
* Option3: Ask SA2 to make the decision

***SummaryProposal*: RAN2 to down-select from the following options for the types of supported services for DL and UL INACTIVE positioning:**

* **Option1: Support only deferred MT-LR**
* **Option2: Support both deferred MT-LR and MO-LR**
* **Option3: Ask SA2 to make the decision**

# 4 UL Positioning

## 4.1 General Thinkings

On some general thinkings for UL positioning:

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| [5340, OPPO] mentioned about the following issues needs to be addressed:  [Proposal 1 If RAN2 decide to look into UL positioning method in RRC\_INACTIVE state, the following issues need to be considered first: 1) how to configure SRS for positioning, and 2) how to maintain timing synchronization with network.](#_Toc71621211)  [6408, VIVO] proposed the following regarding the handling of the objective of UL positioning in RRC\_INACTIVE  Proposal 2: UL positioning in RRC\_INACTIVE should be treated with higher priority as it can improve the device efficiency for power saving critical scenarios. |

**Rapporteur’s comments:**

No actions need to be taken with the above proposals and the configuration and TA will be discussed in section 4.2 and 4.3 below.

## 4.2 SRS configurations

In the parallel WI in RAN2, the following agreement has been made for SDT based on configured grant.

1. The configuration of configured grant resource for UE uplink small data transfer is contained in the RRCRelease message.  FFS if other dedicated messages can configure CG in INACTIVE CG. Configuration is only type 1 CG with no contention resolution procedure for CG.

To configure UE sending SRS in RRC\_INACTIVE, a straight-forward way is to include the SRS configurations in the *RRCRelease*, similar to what we have done for CG-SDT. For example, the RRC Release message can include delta configuration based on the SRS configuration in RRC\_CONNECTED, or full configurations. The UE can transmit SRS according to the configurations after UE entering INACTIVE state.

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| [5303, IDC]  Proposal 5: Support the use of pre-configured SRSp configuration received by UE during RRC CONNECTED for SRSp transmission when in INACTIVE  Proposal 6: Support transmission of SRSp configuration (e.g. using SDT) or indication for initiating SRSp transmission to UE when in INACTIVE  [5216, HW]  Proposal 4: Include SRS configurations in the RRCRelease with suspendConfig message for UL positioning in RRC\_INACTIVE, similar to CG-SDT.  [5703, SONY]  Proposal 3: Specify configuration for UE transmission of SRS for UL positioning during RRC Inactive.  [6104, INTEL]  Proposal 5: Assuming UL SRS is used, the UE can transmit SRS (aperiodic, semi-persistent, periodic SRS) in RRC\_INACTIVE if configured by the network.  Proposal 6: Assuming UL SRS is used, the network can send RRCReconfiguration message (to configure SRS) and/or SRS activation command (MAC CE, DCI) to the UE if there is ongoing SDT for the UE. Otherwise if SDT is not ongoing, rely on legacy operation, i.e. the network shall transit the UE to RRC\_CONNECTED,e.g. based on RAN paging.  [6408, VIVO]  Proposal 4: SRS configuration received in RRC\_CONNECTED can be used in RRC\_INACTIVE UL positioning and can be delivered in RRCRelease message. |

***Rapporteur’s comment:***

Based on the above proposals, the majority of the companies think the configuration of SRS can be carried by RRCRelease message, similar to the design in CG-SDT. Hence, we propose:

***SummaryProposal*: SRS configuration for UL positioning in RRC\_INACTIVE is carried by RRCRelease message with suspendConfig, similar to CG-SDT.**

For SRS transmission during RRC\_INACTIVE state, the TA solution can follow the lines of that of PUR framework. UE can first obtain the freshest TA as an initial TA through *RRCRelease*, then use this initial TA when *timeAlignmentTimer* is running.

For the issues relating to TA and power control of the UE, the following proposals have been made:

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| [6104, INTEL]  Proposal 7: The issues on how transfer UL reference signalling, e.g. power control, TA, etc, should be resolved by the same solution on UL data transmission via CG-SDT, and therefore should not be discussed in positioning WI.  [5216, HW]  Proposal 5: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE, similar to CG-SDT.  Proposal 6: UE performs random access procedure when TAT expires during RRC\_INACTIVE for UL positioning. |

***SummaryProposal*: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE, similar to CG-SDT.**

## 4.3 Involvement with RAN1

The following companies have also proposed to send an LS to RAN1 to trigger the relevant discussions

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| --- |
| [6104, INTEL]  Proposal 4: Send LS to RAN1 to confirm whether UL SRS is reused for UL positioning in RRC\_INACTIVE.  [6408, VIVO]  Proposal 3: LS to RAN1 to inform them that SRS is preferred to be the RS for UL positioning from RAN2 perspective and kindly ask them to take it into account.  Proposal 6: LS to RAN1 to address the issues to support SRS transmission in RRC\_INACTIVE, including sync, power control, spatial relation. |

***SummaryProposal*: RAN2 should send an LS to RAN1 on RAN2’s agreement on UL positioning in RRC\_INACTIVE, and to address the issues on TA, power control, spatial relation, etc.**

# 5 Stage2 Text Proposal for INACTIVE POS

[6083, QC] has proposed a stage 2 text proposal for INACTIVE positioning, first with the following proposals:

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| --- |
| Proposal 3: Develop a baseline Stage 2 description for positioning of UEs in RRC\_INACTIVE state first, incl. support for DL-, UL-, UL+DL, and RAT-independent methods, before discussing e.g. which messages can be transported in RRC\_INACTIVE, etc.  Proposal 5: Agree on the procedures in section 3 as baseline for Stage 2. |

And then with the following Text Proposal

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| --- |
| Figure 1: Low Power Periodic and Triggered 5GC-MT-LR Procedure for UL+DL Positioning.  1. Steps 1-21 for the deferred 5GC-MT-LR procedure for periodic or triggered location events specified in TS 23.273 [3], clause 6.3.1 are performed.  At Step 15 of this procedure described in Figure 6.3.1-1 of TS 23.273 [3], the LMF may perform one or more positioning procedures to obtain an initial UE location estimate. During this step, the LMF may request and obtain the UE positioning capabilities which may include an indication that the UE can support UL+DL positioning in RRC\_INACTIVE state.  The LMF may also provide an UL-PRS configuration, or a set of alternative UL-PRS configurations to the serving gNB via an NRPPa Positioning Information Request message. The serving gNB may then send an NRPPa Positioning Information Response message that indicates whether UL positioning can be supported for the UE in RRC\_INACTIVE state. For a subsequent change of anchor gNB, the UL-PRS configuration(s) is sent to the new serving gNB as part of the transfer of a UE context to the new serving gNB.  The serving gNB then sends an *RRCConnectionRelease* with *suspendConfig* to move the UE to RRC\_INACTIVE state.  2. The UE monitors for occurrence of the trigger or periodic event requested during step 1. The UE determines which positioning method(s) will be used for the detected event from the request in Step 1 (based on the position method(s) included in an LPP Request Location Information message carried in the LCS Periodic-Triggered Invoke Request during Step 1).  The UE may also determine whether event reporting is allowed in RRC\_INACTIVE State based on an indication received during Step 1.  3. When event reporting is allowed in RRC\_INACTIVE State and after (or slightly before) an event is detected, the UE performs a 4‑step or 2-step RACH procedure.  When event reporting is not allowed in RRC\_INACTIVE State, the UE may send an RRC Resume Request to enter RRC Connected State and then reports the event using the procedure in clause 6.3.1 of TS 23.273 [3].  UL-PRS is already configured in the UE and anchor gNB during Step 1.  4. The UE sends a RRC Resume Request incl. a Small Data Request message with LCS Event Indication to trigger UL positioning.  5. The serving gNB fetches the UE context from the anchor gNB. The UE context includes the UL-PRS configuration(s) (as determined during Step 1).  6. The serving gNB determines the UL-PRS configuration based on the UE context information received at Step 5b and sends a NRPPa Positioning Information Update message to the LMF via the serving AMF (probably through the anchor gNB). If the serving gNB does not have any UL-PRS configuration information, the serving gNB may send an indication to the LMF to request an UL-PRS configuration or the serving gNB may send an RRC Release to the UE indicating that the UE should perform normal event reporting.  7. The LMF may send a NRPPa Positioning Activation message (possibly with a starting time) to the serving gNB to request UL-PRS activation in the UE.  8. The serving gNB provides the UL-PRS configuration to the UE as part of the RRC Release message over msg4 or MsgB. The message may also include the CG Configuration.  NOTE: The UL-PRS configuration at this step may be an index to a pre-configured UL-PRS configuration (during Step 1), or a delta-UL-PRS configuration, etc. This may also be part of the MAC-CE SRS Activation and/or a new MAC-CE.  9. The serving gNB sends a NRPPa Positioning Activation Response message to the LMF when activation in the UE was successful.  10. The LMF sends a NRPPa Measurement Request to a group of gNBs incl. the UL-PRS measurement configuration.  11. The UE transmits UL-PRS according to the activated configuration at Step 8.  12. The UE measures the DL-PRS, and each configured gNB at Step 10 measures the UL-PRS.  13. The UE performs a 4‑step or 2-step RACH procedure.  14.The UE sends an RRC Resume Request message to the serving gNB incl. a "Small Data Request message" with the SS LCS Event Report together with an LPP Provide Location Information message containing the DL-PRS measurements.  15. The serving gNB sends the SS LCS Event Report to the anchor gNB, which provides the SS LCS Event Report to the LMF (via serving AMF).  16. The gNBs that performed the UL-PRS measurements provide an NRRPPa Measurement Response message to the LMF including the UL-PRS measurements performed at Step 12b.  17. The LMF performs a position determination using the DL-PRS measurements obtained at Step 15 and the UL-PRS measurements obtained at Step 16.  18. The LMF may send a NRPPa Positioning Deactivation Request message to the anchor gNB which forwards the message to the serving gNB. The serving gNB sends the UL-PRS Deactivation to the UE at Step 18b.  19. The LMF sends a SS LCS Event Report Acknowledgement to the anchor gNB.  20. The serving gNB provides the SS LCS Event Report Acknowledgement to the UE as part of the RRC Release message.  21. Steps 28-31 for the deferred 5GC-MT-LR procedure for periodic or triggered location events specified in TS 23.273 [3], clause 6.3.1 are performed. |

***Rapporteur’s comments:***

We think the text proposal from [6083, QC] can be a good starting point for the stage2 description for UL and DL positioning in RRC\_INACTIVE. Hence, we propose the following:

***SummaryProposal*: Develop a baseline Stage 2 description for positioning of UEs in RRC\_INACTIVE state first, including support for DL-, UL-, UL+DL, and RAT-independent methods based on the stage2 text proposal in [6083, QC]**

# 6 Relation with the CN

During this meeting, quite a lot of contributions have discussed the relationship with core network.

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| Joint contribution [6434, INTELetAL] has proposed the following for the relationship between the INACTIVE positioning objective in RAN and the core network:  **Proposal 5: RRC\_INACTIVE UE shall use NAS signalling connection for reception/transmission of LPP/LCS messages, and from RAN2** perspective **it is transparent to the CN on whether or not SDT is used;**  [5216, HW] has mentioned that the support of INACTIVE positioning needs to be made aware of the other groups and proposed to send an LS to SA2 for RAN2’s agreement on INACTIVE positioning.  [5703, SONY]  Proposal 2: Existing procedures defined in TS 23.273 would support transport of NAS based LPP messages.  [5971, ERI]  Proposal 4 Send a LS to SA2 to allow repetition of LCS Periodic Trigger as specified in R2-2105973.  [6409, VIVO]  Proposal 5: LS to SA2 to confirm whether positioning in RRC\_INACTIVE is restrict to specific location type (e.g. low power periodic and triggered 5GC-MT-LR).  [6083, QC]  Proposal 1: Support the low power periodic and triggered 5GC-MT-LR procedures (clause 6.7 of TS 23.273 [3]) using the NR Small Data Transmission (SDT).  Proposal 2: If Proposal 1 can be agreed, send an LS to SA2 informing them about the RAN2 agreement. |

Based on the above proposals, we propose that

***SummaryProposal*: Send an LS to SA2 for the agreements in RAN2 for INACTIVE positioning and any questions that RAN2 agree to send.**

# 7 Others

## 7.1 UE capability for INACTIVE positioning

The following proposals have been provided for the UE capability for INACTIVE positioning.

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| [4802, CATT]  Proposal 2: RAN2 discuss whether to introduce assistance info which can be used to assist NG-RAN node to decide to release the UE into RRC\_INACTIVE, and whether to configure SDT for SRB2. The following assistance info from LMF to NG-RAN can be considered:  -whether the UE supports positioning in RRC\_INACTIVE;  -periodicity of UE measurement report.  [5601, LEN]  Proposal 11: RAN2 to confirm if the capability information among UEs performing RRC\_CONNECTED or RRC\_INACTIVE positioning will be different and whether special capability indication is necessary. |

**Rapporteur’s comments:**

For the UE capability for INACTIVE positioning, from our understanding, the capability for the LMF and the gNB can be discussed at the end of the standardization of the work item.

***SummaryProposal*: RAN2 to discuss in future meetings whether to define UE capability in RRC and LPP for the UE’s support for UL and DL positioning in RRC\_INACTIVE.**

## 7.2 Discussion should be lead by the other groups

### Measurement for DL positioning

It has been mentioned in [5601, LEN] that the discussion in RAN4 should be triggered for the measurement for DL positioning:

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| Proposal 3: Send an LS to RAN4, Cc RAN1 indicating at least the need for support and measurement requirements for the following DL-only positioning measurements in RRC\_INACTIVE state:   * DL PRS-RSRP * DL Reference Signal Time difference (DL RSTD) |

***Rapporteur’s comments:***

In the WID, RAN4 and RAN1 have already been included as responsible group for DL measurement in DL POS in RRC\_INACTIVE. Hence, no need to take further action on this.

### Measurement gap

Regarding the role of measurement gap for INACTIVE positioning, the following has been proposed:

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| --- |
| [6430,ZTE]  Observation 1: PRS measurement should be performed during DL positioning procedures in Rel-16.  Observation 2: RAN1 and RAN4 are responsible for the evaluation of the measurement gap issue in INACTIVE positioning.  Observation 3: Because either RAN1 or RAN4 does not allocate time budget to discuss the measurement gap issue in INACTIVE positioning, they will not discuss this until RAN2 sends LS to them.  Proposal 1: RAN2 should send an LS to RAN1 and RAN4 and trigger the evaluation whether the autonomous gap or special search space configuration is sufficient for PRS measurement in SDT based DL INACTIVE positioning. |

While, in the WID, RAN1 and RAN4 has already been included as the leading group for latency reduction for measurement, as below:

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| --- |
| * Specify the enhancements of signalling, and procedures for improving positioning latency of the Rel-16 NR positioning methods, for DL and DL+UL positioning methods, including:   + Latency reduction related to the request and response of location measurements or location estimate and positioning assistance data; [RAN2, RAN3, RAN1]   + Latency reduction related to the time needed to perform UE measurements; [RAN1, RAN4]   + Latency reduction related to the measurement gap; [RAN1, RAN4, RAN2] |

Hence, no further action is needed for now.

## 7.3 Issues not covered under the WID

The following has been proposed for the CG configuration for sending periodic measurements

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| [5309, IDC]  Proposal 4: Support configuring of CG that is valid across different cells for sending periodic measurement report/location estimates when in INACTIVE |

However, the following clarification on the scope has been provided

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| R2-2104921 Clarification on work scope of Rel-17 positioning enhancement Intel Corporation discussion Rel-17 NR\_pos\_enh  Proposal 1: “Latency reduction related to the reporting of the measurements (CG-based transmission)” has been excluded from WI scope;  Proposal 2: “Storing UE positioning capability” has been excluded from WI scope;  Proposal 3: SDT related issues should be discussed in SDT WI, e.g. how UE transfers UL and receives DL in INACTIVE; Positioning specific SDT change is not expected based on RAN plenary discussion;  Proposal 4: Send LS to RAN1, ask them to evaluate what parameters can be changed for on-demand PRS, e.g   * Beam ON/OFF request * ON/OFF request for the PRS request * Configuration index * Explicit PRS configuration, e.g., periodicity, repetition, bandwidth, etc. * Low power indication * Preferred number of gNBs/TRPs * Preferred starting and validity time |

Thus, we think this is not within the scope of the WID and should not be discussed anymore.

## 7.4 Solutions need more study

Regarding the assistance information, [4802, CATT] has proposed that NG-RAN should provide the visited cell information to the LMF for the configuration.

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| [4802, CATT]  Proposal 3: RAN2 discuss how to ensure valid assistance data for positioning in RRC\_INACTIVE as much as possible, e.g. NG-RAN provides the visited cell information to the LMF to assist configuration of positioning assistance data.  [5601, LEN]  Proposal 9: RAN2 to consider low latency change notifications of posSIBs for UEs performing RRC\_INACTIVE/RRC\_IDLE positioning, e.g. using paging and SI change notification messages.  [6408, VIVO]  Proposal 5: SRS configuration used in RRC\_INACTIVE is valid in a specific area (e.g. a cell list) and can be updated by state transition or via SDT.  [5309, IDC]  Proposal 1: Support alignment between the DL-PRS reception/measurements and DRX configuration  Proposal 2: Existing LPP and RRC procedures can be enhanced for configuring and aligning in UE the DL-PRS and DRX configurations |

The following has been proposed to use paging/RACH procedure for initiating PRS measurement or SRS transmission

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| --- |
| [5703, SONY]  Proposal 4: Support initiation of DL and UL based positioning triggered via paging the UE to either start and/or for configuration of respective Positioning in RRC inactive  [5303, IDC]  Proposal 3: Support transmission of DL indication to UE for initiating measurement of preconfigured PRS when in INACTIVE using paging/RACH procedure |

***Rapporteur’s comments:***

For the above proposal, it should be noted that MT data is currently not under the scope of SDT. If this needs to be supported, current stage3 spec also needs to be changed for the UE to understand the reason for paging. Hence, RAN2 can leave this for further study

For the above proposal, we think more detailed explanations need to be given for the solution. Thus, we propose RAN2 to further study on this

***SummaryProposal*: RAN2 should further study the following for INACTIVE positioning:**

* **Low latency change notification of posSIB with paging and SI change notification message**
* **Applicability of the SRS configuration with mobility and whether to define a validity area for this**
* **Alignment between DL-PRS reception/measurement and DRX configurations**
* **Use paging to trigger the PRS measurement of SRS transmission in RRC\_INACTIVE POS**
* **Optimize the data size of positioning reports for INACTIVE POS**
* **Modify the SDT data volume threshold considering the data size of positioning reports**
* **gNB inform LMF for the SDT data volume threshold, the LMF adjust configuration for positioning data report, LMF indicate to the gNB the estimated size of measurement reports**

## 7.5 Issues not limited to INACTIVE POS

Beside, the following proposal has also been proposed that may not be only applicable for IANCTIVE POS, but can be discussed under a more general discussion:

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| [5971, ERI]  Proposal 5 Support of posSIB retrieval using SDT in Inactive mode is supported along with unicast tag. |

***SummaryProposal*: The following can be discussed under a more general discussion not confirm to INACTIVE POS**

* **Unicast tag in system information for posSIB retrieval**

# 8 Conclusion

In this contribution, we provide a summary for all the contributions submitted under AI 8.11.3 for INACTIVE POS. The following are proposed for RAN2#114e:

## 8.1 Proposals need to be decided

*Downlink Positioning*

***SummaryProposal1*: Any uplink LCS or LPP message can be transported in RRC\_INACTIVE from RAN2 perspective**

***SummaryProposal2*: Selection of SDT vs non-SDT is performed by the lower layer for transport of the positioning message for INACTIVE positioning.**

***SummaryProposal3*: Support the following options for the transport of measurement results and/or location estimate for positioning in RRC\_INACTIVE**

* **Case1: PRS measurement and/or location estimate performed in RRC\_INACTIVE can be sent in RRC\_INACTIVE**
* **Case2: PRS measurement and/or location estimate perform in RRC\_INACTIVE can be sent in RRC\_CONNECTED**
* **Case3: PRS measurement and/or location estimate performed in RRC\_CONNECTED can be sent in RRC\_INACTIVE**

***SummaryProposal4*: The mechanism for positioning assistance information delivery in RRC\_CONNECTED can be reused for positioning in RRC\_INACTIVE.**

* **Case1: The network broadcasts posSIB with/without SI request**
* **Case2: Assistance Information delivery during RRC\_CONNECTED**

**FFS whether to add additional information to differentiate the Assistance Information used for RRC\_INACTIVE and RRC\_CONNECTED**

***SummaryProposal5*: All RAT-independent positioning methods in RRC\_INACTIVE can be supported from RAN2’s perspective. Send an LS to RAN4 on RAN2’s agreement on the support of RAT-Independent positioning.**

***SummaryProposal6*: Support DL E-CID for RRC\_INACTIVE positioning. FFS support for UL E-CID**

***SummaryProposal7*: Support of SDT for positioning can be discussed in SDT session.**

*Common Aspects of Downlink and Uplink Positioning*

***SummaryProposal8*: The agreements for DL are also valid for UL, unless it is either obvious that they are not needed for/related to UL or unless it is explicitly stated so.**

***SummaryProposal9*: Follow Rel-17 SDT framework for INACTIVE UL and DL positioning:**

* **If the UE initiated data transmission using UL SDT, the network can send DL LCS, LPP message and RRC message (e.g. to configure SRS (TBD on what message is used), if UL positioning supported) to the UE.**
* **Otherwise, if UE did not initiate UL SDT, rely on legacy operation, i.e. the network shall transition the UE to RRC\_CONNECTED, e.g. based on RAN paging.**

***SummaryProposal10*: RRC state of the UE is not exposed to the positioning function in UE and LMF for UL and DL INACTIVE Positioning. This can be revisited/enhanced in future if deemed useful.**

***SummaryProposal11*: RAN2 to down-select from the following options for the types of supported services for DL and UL INACTIVE positioning:**

* **Option1: Support only deferred MT-LR**
* **Option2: Support both deferred MT-LR and MO-LR**
* **Option3: Ask SA2 to make the decision**

*Uplink Positioning*

***SummaryProposal12*: SRS configuration for UL positioning in RRC\_INACTIVE is carried by RRCRelease message with suspendConfig, similar to CG-SDT.**

***SummaryProposal13*: TA configuration is included in RRCRelease with suspendConfig for UL positioning in RRC\_INACTIVE, similar to CG-SDT.**

***SummaryProposal14*: RAN2 should send an LS to RAN1 on RAN2’s agreement on UL positioning in RRC\_INACTIVE, and to address the issues on TA, power control, spatial relation, etc.**

*Stage2 Text Proposal*

***SummaryProposal15*: Develop a baseline Stage 2 description for positioning of UEs in RRC\_INACTIVE state first, including support for DL-, UL-, UL+DL, and RAT-independent methods based on the stage2 text proposal in [6083, QC]**

*Relationship of INACTIVE POS with Core Network*

***SummaryProposal16*: Send an LS to SA2 for the agreements in RAN2 for INACTIVE positioning and any questions that RAN2 agree to send.**

## 8.2 Proposals need to be studied

***SummaryProposal17*: RAN2 to discuss in future meetings whether to define UE capability in RRC and LPP for the UE’s support for UL and DL positioning in RRC\_INACTIVE.**

***SummaryProposal18:* RAN2 should further study the following for INACTIVE positioning:**

* **Low latency change notification of posSIB with paging and SI change notification message**
* **Applicability of the SRS configuration with mobility and whether to define a validity area for this**
* **Alignment between DL-PRS reception/measurement and DRX configurations**
* **Use paging to trigger the PRS measurement of SRS transmission in RRC\_INACTIVE POS**
* **Optimize the data size of positioning reports for INACTIVE POS**
* **Modify the SDT data volume threshold considering the data size of positioning reports**
* **gNB inform LMF for the SDT data volume threshold, the LMF adjust configuration for positioning data report, LMF indicate to the gNB the estimated size of measurement reports**
* **The assistance information from LMF to NG-RAN for the periodicity of the periodic deferred MT-LR for CG-SDT with the LMF knowing the RRC state of the UE**

***SummaryProposal19*: The following can be discussed under a more general discussion not confirm to INACTIVE POS**

* **Unicast tag in system information for posSIB retrieval**

# 9 Reference

1. RP-210903, Revised WID on NR Positioning Enhancements, Intel Corporation, CATT.
2. R2-2104921, Clarification on work scope of Rel-17 positioning enhancement, Intel Corporation.