3GPP TSG RAN WG2 Meeting #123bis R2-230xxxx

Xiamen, China, 9th– 13th October, 2023

Agenda Item: 7.7

Source: THALES

Title: [Post123][NR NTN Enh] Remaining Open Issues (Thales)

Document for: Information

# Introduction

This document aims at summarizing open issues that need to be addressed for NR Non-Terrestrial Networks enhancements Work Item in RAN2.

# Discussion

**Coverage enhancement remaining open issues**

* To specify PUCCH enhancements for Msg4 HARQ-ACK (e.g. repetition) [RAN1, RAN4]
  + MAC aspect: Decision on LCID extension for Msg3 indication for PUCCH repetition for Msg4 HARQ-ACK
    - * It will be concluded in the next meeting. Expected to be discussed in the main session, limited work to be expected

**Network verified UE location remaining open issues**

* RAN to prioritize the specification of necessary enhancements to multi-RTT to support the network verified UE location in NTN assuming a single satellite in view [RAN1, 2, 3, 4]. RAN 1 concluded the work during the last meeting
  + Discussion on possible RAN2 aspects
  + Discussion on Cell change handling
  + No work related to mirror-image ambiguity issue (to be handled in RAN3)

**Cell reselection enhancements remaining open issues**

* For NTN-NTN mobility, specify cell reselection enhancements for earth moving cell, the timing based and location-based cell reselection for quasi-earth fixed cell in Rel-17 can be considered as the starting point. [RAN2, RAN3, RAN4]
  + No more work to achieve the objective
* Specify cell reselection enhancements for RRC\_IDLE/INACTIVE UEs to reduce UE power consumption (NTN-TN mobility is prioritized). [RAN2, RAN3, RAN4]
  + Details of a new SIB to provide the TN coverage information in NTN cell
  + Specify broadcast of NTN information in TN cell for NTN-TN service continuity

**Handover enhancements remaining open issues**

* Specify cell reselection enhancements for RRC\_IDLE/INACTIVE UEs to reduce UE power consumption (NTN-TN mobility is prioritized). [RAN2, RAN3, RAN4]
  + Remaining details of unchanged PCI scenario
    - MAC aspect: Time alignment timer (TAT) handling
    - MAC aspect: Whether to support additional enhancement to confirmation of RACH-less HO completion
  + Remaining details of RACH-less HO
    - MAC aspect: Time alignment timer (TAT) handling
    - Optionally, Let’s check time-based CHO combining with RACH-less
  + MAC aspect : Whether preallocated grant can be configured without ntn-RSRP-ThresholdSSB
  + Discussion on possible RAN2 MAC spec impact for the agreement “Single beam can be indicated in HO command to monitor target cell PDCCH for dynamic grant for initial UL transmission”

# Conclusions

This open issue list is just for information.