3GPP TSG RAN #98-e
E-meeting, December 12th - 16th, 2022
Agenda Item: 9.3.2.7
Document for: Decision

RP-223169

Discussion on Rel-18 NR NTN

NTT DOCOMO, INC.

Background

WID description (RP-222654)

4.1.1 Coverage enhancement

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The detailed objectives are for NTN:

- To specify PUCCH enhancements for Msg4 HARQ-ACK (e.g. repetition) [RAN1, RAN4]
- To study DMRS bundling for PUSCH taking into account NTN-specifics (e.g. time-frequency pre-compensation) and, if necessary, specify enhancements to the Rel-17 procedures [RAN1]

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4.1.3 Network verified UE location

Pending on the conclusion of the RAN SI FS_NR_NTN_netw_verif_UE_loc study item, study and evaluate, if needed, solutions for network to verify UE reported location information [RAN2,RAN1,RAN3].

RAN is expected to determine by RAN#98 whether the study has identified any need for Network verified UE location specification support in Rel-18.

SID description (RP-221820)

The objective of this RAN led SI is:

Study detailed regulatory requirements (e.g. accuracy, privacy, reliability, latency) for network-verified UE location for NTN and for potential use cases/services (i.e. emergency call, lawful intercept, public warning, charging/billing).

Discussion

- Clarification of 'PUCCH enhancements for Msg4 HARQ-ACK'
  - At the last RAN1 meetings, it was discussed which PUCCH should be enhanced since RAN1 spec is not using the terminology, but there was no consensus
  - The following possibilities were raised:
    - » Option 1: PUCCH transmission when dedicated PUCCH resource configuration is not provided
    - » Option 2: PUCCH transmission when PUCCH resource is indicated by a DCI format 1_0 with CRC scrambled by TC-RNTI
  - In our view, Option 1 should be adopted
    - » In Rel-15, when RAN1 had discussion and made specification on PUCCH relevant to initial access procedure, the terminology of Option 1 was used. There seems no reason to change this experienced direction
    - » When dedicated PUCCH-Config is provided is up to NW implementation though Msg4 PDSCH can include the configuration; If the configuration is not provided via Msg4 PDSCH, feedback of one or more subsequent PDSCH needs to use common PUCCH. Then the coverage issue should be addressed together

Proposal: For coverage enhancement, 'PUCCH enhancements for Msg4 HARQ-ACK' in WID is replaced to 'PUCCH enhancements for PUCCH transmission when dedicated PUCCH resource configuration is not provided'

- ***It is understood that this update is also applied to existing agreements/conclusions***

Discussion

- WID for NW verified UE location
  - At the last RAN1 meetings, it was concluded that network verification of UE location in NR NTN with single satellite in view with multi-RTT and DL-TDOA can meet the accuracy requirement with certain conditions. We believe that these two mechanisms should be further studied
  - In addition, there was no consensus on whether/which information reported by UE during verification procedure can/cannot be regarded as trusted. This issue should be solved in this meeting

Proposal: Apply the following for objectives of NW verified UE location

- ***Study and specify, if necessary, enhancements on multi-RTT and DL-TDOA positioning methods for network to verify UE reported GNSS location information***
  - » ***Enhancements of signaling/procedures (e.g., measurements, new assistance data, etc.) in consideration of NTN-specific issues (e.g., impact of satellite movement, ambiguity if mirror position, UE locates near orbit plane, etc.) [RAN1, RAN2]***

Proposal: RAN to discuss and conclude whether/which information reported by UE during verification procedure can/cannot be regarded as trusted

- ***Send an LS to SA for confirmation if needed.***

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