RP-213327

Agenda Item 8A.2

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Views on Rel-18 IoT NTN enhancements

3GPP TSG-RAN #94e

Electronic Meeting, December 06 – 17, 2021

Introduction

- *Rel-18 IoT-NTN should support features and deployment scenarios not covered in Rel-17, considering further improvement of power and spectral efficiency.*
- *This contribution provides NEC views on New WID on IoT NTN enhancements.*

New WID on IoT NTN enhancements

IoT-NTN Performance Enhancements in Rel-18 to address remaining issues from Rel-17

- Disabling of HARQ feedback to mitigate impact of HARQ stalling on UE data rates [RAN1,RAN2]
- Study and specify, if needed, improved GNSS operations for a new position fix for UE pre-compensation during long connection times and reduced power consumption [RAN1]

Mobility enhancements

- Enhancements on RLF and RRC reestablishment, e.g., conditional RRC reestablishment. [RAN2]
- Support of neighbour cell measurements and corresponding measurement triggering before RLF. This may include legacy (Rel-17) [RAN2]
- Solutions introduced in Rel-17 NR NTN for mobility enhancements (e.g. location-based CHO and timing-based CHO) for eMTC [RAN2]
- [NB-IoT carrier selection based on the coverage level, and associated carrier specific configuration] [RAN1, RAN2]

Further enhancement to discontinuous coverage

- Efficient power saving mechanisms (e.g., eDRX/PSM) for sparse satellite constellations [RAN2]
- Improvements to UE mobility among sparse cells [RAN2]
    - Enhancements in RRC reestablishment or recovery based on the discontinuity of coverage
- [Further power saving enhancements for IoT NTN to support discontinuous coverage including PUR for NGSO (2nd priority)] [RAN2]

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Evolution of IoT (Internet of Things) NTN

RAN1-led

- **<u>HARQ enhancement</u>**
  - Increasing the number of HARQ processes
  - HARQ feedback disabling
  - PDCCH monitoring reduction

- **<u>Beam-level mobility</u>**
  - Ncells with multiple anchor carriers

Proposal 1: Support above RAN1-led objectives and prioritize HARQ enhancements in Rel-18.

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Evolution of IoT (Internet of Things) NTN

RAN2-led

◆ Mobility

- Enhancements on RLF and RRC reestablishment, e.g. conditional RRC reestablishment
- Support of neighbor cell measurements and corresponding measurement triggering before RLF. This may include legacy (Rel-17)
- Solutions introduced in Rel-17 NR NTN for mobility enhancements (e.g. location-based CHO and timing-based CHO) for eMTC

Proposal 2: Prioritize mobility issues related to RLF, reestablishment and CHO in Rel-18.

Enhancements on following aspects can also be considered:

- NB-IoT carrier selection based on the coverage level, and associated carrier specific configuration

We believe issues below should be discussed in NR NTN first. Based on the solution for NR NTN, once critical issues have been identified, we can further consider the enhancement.

- Reduce handover signaling overhead
- RACH congestion
- NTN and TN mobility enhancement

Proposal 3: Deprioritize overlap issues between NR-NTN and IoT-NTN.

◆ Enhancements of supporting discontinuous coverage

The main difference compared to NR NTN is that power saving is more important. Related objectives are highly dependent on the outcome of Rel-17 and they need to be re-evaluated once Rel-17 completes.

Proposal 4: Re-evaluate power saving-related objectives after completion of Rel-17.

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