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3GPP TSG RAN Meeting #102 RP-232986
Edinburgh, Scotland, December 11-15, 2023

Agenda Item: 10.1.2.1

Source: Spreadtrum Communications

Title: NTN evolution for IOT in Rel-19

Document for: Discussion and decision

Introduction

In Chair's summary for RAN Rel-19 Package [1], the following potential objectives on IOT NTN are provided:

NTN (Non-Terrestrial Networks) evolution - IoT WI

- References: RWS-230488, RP-231540, RP-232621
- Potential objectives:
  - Store & Forward (requiring regenerative payload), with close coordination with SA2
  - Capacity enhancements for Uplink???, similar to NR NTN (need to be specific)
  - Mobility enhancements (depending on R18 progress. All completed in Rel-18?)
  - Others?
    - "Coarse Location Reporting" in case…. (SA2/CT1 discussion?)

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[1] RP-232745 Summary for RAN Rel-19 Package: RAN1/2/3-led

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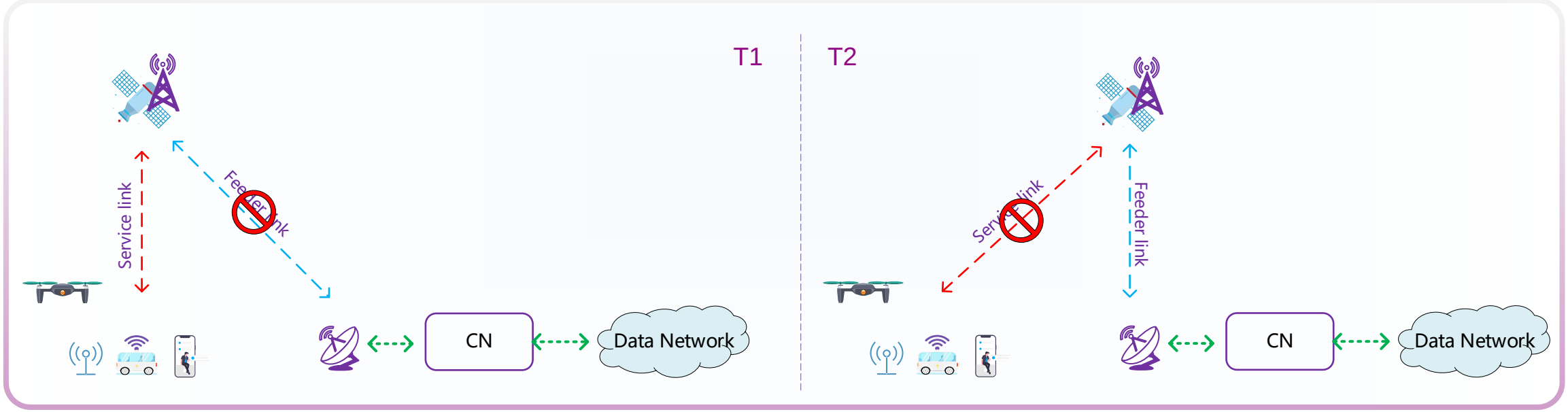
Motivation

- S&F operation is beneficial for sparse satellite constellations and NTN gateway/ground segment infrastructure deployment.
- SA2 has approved a New SID to support S&F operation for delay-tolerant communication service.
- To align with SA2, corresponding RAN work should be considered.



Proposal 1: Support Store and Forward operation in IOT NTN.

- **Signaling of Informing of S&F operation**
- **Impact on control plane procedures, e.g. suspend and resume**
- **Impact on user plane data transmission**

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Motivation

- The satellite cell has a large coverage area (especially for GEO), and the number of users in the cell is huge (especially for IoT terminals). The demand for system capacity improvement is very urgent, especially for uplink transmission capacity.

Proposal 2: Support system capacity improvement in IOT NTN (at least for UL transmission) .

- Support multi-carrier operation enhancements for NPUSCH/NPRACH transmission
- Support using OCC (orthogonal cover code) to increasing the capacity/spectral efficiency

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The following objectives should be considered in Rel-19 IOT NTN

- **Support Store and Forward operation in IOT NTN [RAN2, RAN3] .**
  - Signaling of Informing of S&F operation
  - Impact on control plane procedures, e.g. suspend and resume
  - Impact on user plane data transmission
- **Support system capacity improvement in IOT NTN (at least for UL transmission) [RAN1, RAN2]**
  - Support multi-carrier operation enhancements for NPUSCH/NPRACH transmission
  - Support using OCC (orthogonal cover code) to multiplexing multiple UEs in same time/frequency resource

Thanks

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