3GPP TSG RAN Rel-18 workshop
Electronic Meeting, June 28 - July 2, 2021
Agenda Item: 4.2
Document for: Discussion

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Study on HAPS with relay-like architecture

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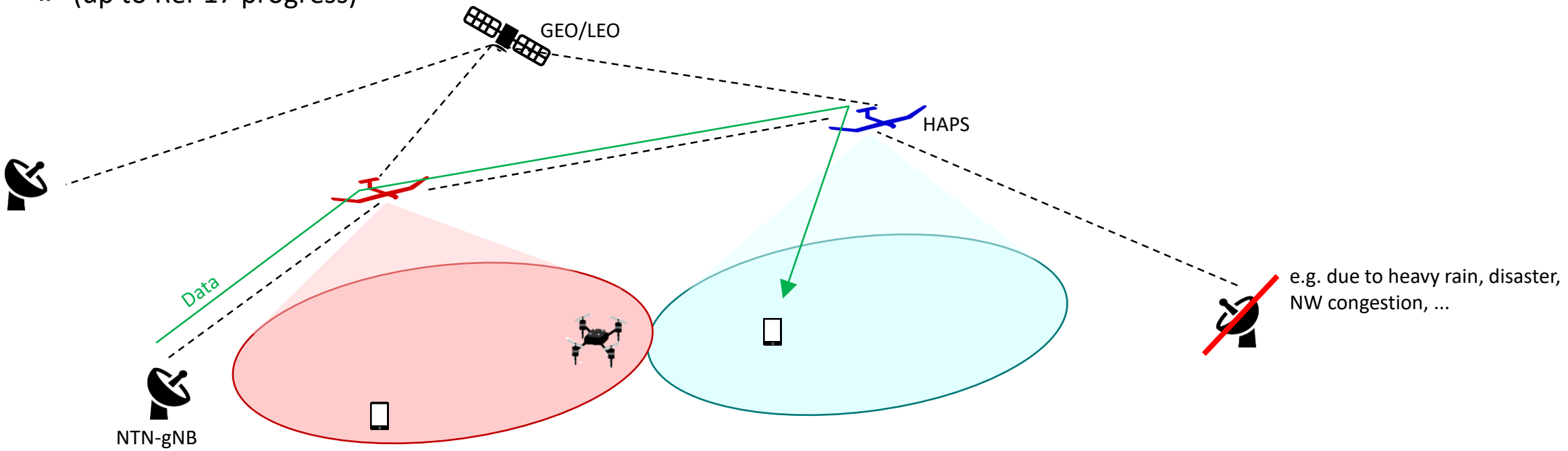
Background/Motivation

- **Rel-17 Non-Terrestrial Network (NTN)** will enable 5G services in un-served areas e.g. that cannot be covered by terrestrial 5G network
  - Mainly assume GEO and LEO
    - » HAPS could be supported by the same specification due to lower delay/Doppler value and variation rate
  - Focus on single satellite/UAS platform with transparent payload architecture

- For Rel-18 NTN, **HAPS with relay-like architecture** will be a promising direction to 5G network more effectively and broadly
  - Why HAPS?
    - » Lower latency: Smaller distance compared to GEO/LEO
    - » Higher sustainability: Capability of landing after termination
    - » Better frequency efficiency: Same frequency between NTN and TN
    - » Earlier response in disaster: Easier launch than GEO/LEO
  - Why relay-like?
    - » Redundant aerial network
      - – Better reliability
      - – More effective QoS management

Proposal

- **Study on HAPS with relay-like architecture**
  - Verify the applicability of Rel-17 NTN to implement NW by using HAPS
    - » (Although Rel-17 NTN could cover HAPS, sufficient study was not done in the study phase)
  - Relay-like architecture, including GEO/LEO
    - » IAB-based mechanism would be a possible direction
    - » For redundant NW, GEO/LEO can be a node in relay-like architecture
  - Frequency sharing between HAPS and terrestrial network which are developed by a single operator
    - » (up to Rel-17 progress)



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