3GPP TSG RAN#102
Edinburgh, UK – December 11th-15th, 2023

RP-233276
Agenda Item 10.1.2.1

Rel-19 IoT NTN: Scope
[Discussion]

MediaTek Inc.

Proposal

[RAN3-led] NTN Enhancements (IoT)

[1/2]

Support for Regenerative payload with Store & Forward with full eNB onboard [RAN3]:

- Rel-17~18 IoT NTN only support transparent payload: this is a major limiting factor for NGSO NTN whereby coverage, service and QoS are reliant on the availability of a feeder link and its characteristics
- A regenerative payload addresses the above by
  - Lifting the reliance on the feeder link
  - Reducing latency
  - Increasing throughput
  - Increasing capacity

- Specify the support of eNB on board in TS 36.300
- Specify enhancements related to S1 protocol for feeder link switch as needed
- Specify enhancements to support store and forward (S&F) operation for delay-tolerant services for the following if applicable:
  - Network and UE Capabilities on S&F (FFS)
  - Signalling procedures for S&F operation
  - Data transmission under S&F operation (e.g. enforcement of specific S&F QoS requirements such as maximum message size and acknowledgement policy

Note: Coordination with SA2 (Rel-19 SA2 led Sat-Arch ph3 SI) is needed on the detail requirements (e.g. traffic type, or QoS parameters for S&F), network architecture (e.g. whether consider (partial) core network on satellite), etc.

Proposal

[2/2]

[RAN1/2-led] NTN Enhancements (IoT)

Uplink Capacity Enhancement for IoT NTN [RAN1, RAN2, RAN4]

- Contention-Based schemes for PUR with Shared resources (CBS PUR) studied in Release 16 NB-IoT was shown to have high potential for UL capacity but was not specified due to lack of time.
- Specify enhancements to enable multiplexing of multiple UEs (e.g. up to 4) in a single 3.75kHz or 15 kHz subcarrier via orthogonal cover codes for NPUSCH [RAN1]
- Specify enhancements to existing PUR/EDT procedure to minimize the amount of necessary downlink/uplink signaling to complete an PUR/EDT transaction with Contention-Based NPUSCH [RAN1, RAN2]
- Note that PUR/EDT enhancement may be used also independently from the use of OCC

TN/NTN Mobility [RAN2, SA2, CT1]

- Background: (idle) TAU with UE Radio Capability update is triggered at every cell change between a SIB31(incl.NB) cell and a no-SIB31(incl.NB) cell
  - This accommodates RAN2 decision for distinct TN and NTN capabilities (and XOR signaling), while avoiding CN impact at the expense of additional NAS signalling
- Proposal:
  - UE reporting of TN and NTN containers (simultaneously or not), associated MME storage of both containers, and MME indication to eNB (based on RAT being accessed by the UE) of the applicable container to avoid the above TAU overhead
- Note: LS to SA2 to discuss core network to support storage and usage of both UE capability containers, TN and NTN, even if the UE doesn't provide both at the same time