

Agenda Item: 10.5.1

Source: Samsung

Title: Discussion on the follow-up work item for IoT NTN in Rel-17

Document for: Discussion and Decision

- ◇ Rel-17 Study Item for IoT over NTN was approved in RAN#86 (revised in RAN#90-e) with completion in Dec. 2021.
- ◇ In RAN#91-e, a strong demand on the need for NTN-IoT support in Rel-17 was shown by many companies, motivated by a market opportunity to introduce 3GPP technology for IoT in NTN that could be potentially lost if normative work is done in Rel-18.
- ◇ Companies reached a common understanding on the need of normative work for IoT over NTN
 - ◆ [RP-210905] Target to complete by RAN#92-e prioritization of potential enhancements for the functionalities needed specifically for IoT over NTN and recommendations on specification changes needed at least for essential functionality
- ◇ TR 36.765 V1.0.0 with recommendations from RAN1 and RAN2 was endorsed in RAN1 and will be presented to RAN#92-e.

Proposed Way Forward

- ◇ Support to close the Study Item on NTN IoT and start a Work Item in RAN#92-e.
- ◇ Target completion of the NTN IoT WI in Rel-17 time frame: Q4-2021 for RAN1 and Q1-2022 for RAN2 (and RAN3/4 as needed).
- ◇ Considering the limited time for the WI, focus the work scope on essential functionalities and reuse as much as possible what is being specified for NR NTN.
- ◇ Use recommendations from RAN1/2 in TR 36.765 as baseline for WID objectives.

Proposed WI Scope

- ◇ Prioritization of standalone deployment for NB-IoT/eMTC in NTN
- ◇ Work on NR NTN used as baseline for any enhancement
- ◇ Timing relationship enhancements
 - ◆ Modify timing relationships of physical channels as identified during the SI [RAN1]
 - ◆ UL scheduling for FDD-HD (UE-specific TA and/or K_offset) [RAN1,RAN2]
 - ◆ Enhancements for timers, e.g. HARQ timers, contention-resolution timer, etc. [RAN2, RAN1]
- ◇ Enhancements on UL time and frequency synchronization [RAN1,RAN2]
 - ◆ UE pre-compensation aspects due to long transmission on PUSCH and PRACH
 - ◆ GNSS measurements
- ◇ DL synchronization enhancements, e.g. new channel raster [RAN4,RAN1]
- ◇ Support of legacy functionalities such as cell selection/reselection mechanisms, discontinuous coverage, handover, etc. [RAN2]
- ◇ Further discussion on RAN3 work taking into account solutions in NR NTN
- ◇ UE time and frequency pre-compensation accuracy requirements as needed [RAN4]