

**3GPP TSG RAN Rel-18 workshop
Electronic Meeting, June 28 - July 2, 2021**

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Title: Enhancements to NR-NTN and IOT-NTN in R18

Agenda Item: 4

Document for: Discussion

Enhancements for NR-NTN and IOT-NTN for R18

1. Regenerative payload (gNB functions on board) requirements & solutions
2. On-board Edge Computing Solutions
3. MEO use cases
4. UEs without GNSS
5. Non-3GPP defined satellite access to NTN systems
6. Carry-over IOT-NTN items from Release 17
7. Support of Additional Spectrum Bands

Details (1 of 3)

1. Regenerative payload (gNB functions on board) requirements & solutions

R17 addresses transparent satellite payloads and there is need to study and specify solutions with regenerative payloads in R18. Multiple regenerative scenarios should be considered.

2. On-board Edge Computing Solutions

As Edge Computing solutions are becoming increasingly deployed in Terrestrial Cellular Networks, it may be important to study their feasibility within the NTN scenarios. In particular, edge computing at the satellite can provide important functional and performance advantages. As such, on-board edge computing use cases, requirements and solutions should be investigated.

Details (2 of 3)

3. MEO use cases

Presently the NR-NTN standardization work is focused on LEO (600 km & 1200 km) and GEO scenarios. We suggest that MEO scenarios (7000-25000 km) should be studied within the R18 framework. Recognizing that some aspects of the LEO and GEO solutions would apply for MEO scenarios as well, other considerations specific to MEO should be investigated. These could include link budget analysis, performance evaluation, etc.

4. UEs without GNSS

It is well recognized that UEs may not always have GNSS capabilities or sufficient accuracy of GNSS results due to the radio environment the devices are in. Accordingly, alternate NTN solutions should be investigated

Details (3 of 3)

5. Non-3GPP defined satellite access to NTN systems

- Presently, 3GPP standards have solutions for interworking between Terrestrial Cellular Networks and non-3GPP (terrestrial) networks, such as Wi-Fi networks. Additionally, current NTN standardization efforts are also addressing mobility solutions between NR-NTN and NR-TN.
- Recognizing that there exist non-3GPP satellite access networks, it would be useful to study access and traffic steering solutions between such networks and 3GPP-NTN networks.

6. Carry-over IOT-NTN items from Release 17

It is well recognized that certain advanced features were not considered for standardization within R17 framework, due at least partly to the time restrictions. R18 should pick those up for study and standardization. Some of them are:

- “non-essential R17 features” in eMTC, such as Conditional-HO with 5GC, etc.
- “non-essential R17 features” in NB-IoT, such as NB-IoT mobility, etc.

7. Support of Additional Spectrum Bands

In our view, there are spectrum bands other than S & Ka bands which are of commercial interest in the space industry and we suggest that R18 should determine and investigate such bands for NR-NTN operation.

Thank you for your attention!