

# **[RAN3/RAN4] IoT NTN further enhancements**

## [WI]

# Motivation

[1/2]

It is important to focus effort on defining enhancements that ***broaden the applicability*** of IoT NTN, rather than specifying alternatives to existing 3GPP solutions

## Support for Store & Forward [RAN3, (RAN2)]

- Rel-17~18 IoT NTN only support transparent payload: this is a limiting factor for NGSO NTN whereby coverage and service are reliant on the availability of a feeder link and its characteristics
- IoT data (and data sent using 3GPP IoT) are inherently delay-tolerant
  - E.g. for emergency messaging, data delivery is critical with a delay tolerance compatible with 3GPP IoT
- A regenerative payload<sup>1</sup> with *Store & Forward* addresses the above by
  - Lifting the reliance on the feeder link to allow data transmission and storage in absence of such link, and delivery when the feeder link resumes.
- Work is expected to start from SA2

NOTE 1: no ISL will be assumed or specified

## In-band/guard-band co-existence of NB-IoT w/ NR [RAN4]

- RAN4 req currently assume no inband or guardband operation for NB-IoT in an NR channel operated from the same SAN, although UE RF req provide flexibility for this.
- Stakeholder interest was expressed to facilitate this scenario
- It is proposed to specify the corresponding SAN requirements

## High-power UE [RAN4]

- Interest was expressed for high-power IoT NTN UE. (PC TBD)

## Overhead Reduction during NTN/TN mobility [RAN3, (RAN2)]

- Change of UE capabilities between TN/NTN triggers TAU or retrieval of capabilities from the UE, leading to additional overhead esp. with discontinuous coverage. Avoiding/reducing overhead is needed<sup>2</sup>. Work is expected to start from SA2.

NOTE 2: backwards compatibility with legacy UEs required

# Proposal

## Further enhance RAN support to broaden the applicability of IoT NTN in terms of catered use cases and deployment scenarios.

- 1) Specify RAN enhancements under guidance from SA2 to support regenerative architecture “store & forward” operation for IoT NTN [RAN3/(RAN2)]
- 2) Specify means to reduce or avoid signaling overhead at TN/NTN mobility in accordance with guidance from SA2. Backwards compatibility with legacy UEs is required. [RAN3/(RAN2)]
- 3) Specify SAN RF requirements for inband/guardband operation for NB-IoT NTN within an NR NTN channel, operated from the same SAN. Requirements shall be applicable to existing satellite access bands and future bands [RAN4]
- 4) Specify RF requirements for high power UE for NB-IoT NTN. PC [TBD] is targeted. [RAN4]

# Expected TU

	2024												2025 [Calendar TBC at the time of writing]												2026		
	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
<b>RAN</b>	<b>103</b>			<b>104</b>			<b>105</b>			<b>106</b>			<b>107</b>			<b>108</b>			<b>109</b>			<b>110</b>			<b>111</b>		
R1	115b	116		116b	117			118		118b	119		119b	120		120b	121			122		122b	123		123b	124	
R2	124b	125		125b	126			127		127b	128		128b	129		129b	130			131		131b	132				
R3	122b	123		123b	124			125		125b	126		126b	127		127b	128			129		129b	130				
R4	109b	110		110b	111			112		112b	113		113b	114		114b	115			116		116b	117		117b	118	
R1	N/A			N/A	N/A		N/A			N/A	N/A		N/A			N/A	N/A		N/A								
R2				0	0		0			0	0		0.5			0.5	0.5		0.5								
R3				0	0		0			0	0		0.5			0.5	0.5		0.5								
R4 RD				N/A	N/A		N/A			N/A	N/A		N/A			N/A	N/A		N/A								
R4 RF				0	0		0.25			0.25	0.25		0.25			0.25	0.25		0.25								

