

Smarter technology for all

3GPP TSG RAN#93-e
Electronic Meeting, September 13 – 17, 2021

RP-212452

Agenda Item:	9.0.2
Source:	Lenovo, Motorola Mobility
Document for:	Discussion

Further Enhancements for NR operation from 52.6 – 71 GHz

The Lenovo logo is positioned vertically on the right side of the slide. It consists of the word "Lenovo" in a white, sans-serif font, set against a vertical rectangular background that transitions from red at the top to orange at the bottom.

Motivation

- In NR Rel-17, the basic support for operation in FR2-2 (52.6 – 71GHz) is being specified considering new numerologies including 480kHz and 960kHz and channel access
- In NR Rel-18, we should aim to further build/optimize the specifications to facilitate/motivate commercial deployment in FR2-2
 - **Two-fold enhancements should be considered**
 - First, to prioritize aspects that were not within the scope of Rel-17
 - Second, identify the essential leftovers that could not be fully specified in Rel-17
 - To have better clarity on leftover items, it should be further discussed after the RAN WG meetings in November 2021 and added within the scope (if needed) in RAN#94-e
 - It is quite likely that channel access aspects might need to further considered in Rel-18

Key Aspects for Further Enhancements in FR2-2 (2/2)

- **Coverage Enhancements**

- Motivation

- In Rel-17, coverage enhancements left out of scope for NR operation in FR2-2
- Due to strict regulatory requirements in terms of EIRP and PSD, limited coverage is a key issue and coverage enhancement for FR2-2 should be prioritized

- Technical Aspects

- Bottleneck channels in terms of coverage for FR2-2 should be evaluated and corresponding enhancements should be specified
 - UL coverage enhancements specified in Rel-17 should be baseline for at least multi-PUSCH scheduling

Key Aspects for Further Enhancements in FR2-2 (1/2)

- **Multi-beam Enhancements**

- Motivation

- In Rel-17, extending SSB beams to more than 64 left out of scope
 - Further narrower beams beneficial to further exploit beamforming gain and increase coverage
- Moreover, no-LBT agreed to be specified in Rel-17 is reliant on highly directional beams with high beamforming gains

- Technical Aspects

- Increased number of beams for FR2-2 should be specified [RAN1/RAN2/RAN4]
- Necessary enhancement for TCI framework should be considered

Proposal for Enhancements for FR2-2 operation in NR Rel-18 *

- RAN1-led WI for further enhancements for NR operation from 52.6 – 71 GHz with following objectives:
 - Specify the required enhancements for coverage extension in FR2-2 including [RAN1]
 - Initial access, PDCCH, PUSCH & PUCCH
 - Consider Rel-17 coverage enhancements for UL as the baseline
 - Specify the required enhancements for multi-beam in FR2-2 including [RAN1]
 - Increased number of SSB beams
 - Necessary enhancements for TCI framework
 - Consider further items as potential leftovers from Rel-17 in RAN#94-e

* *Our accompanying contribution with draft WID in RP-212453*

Proposal for TU Allocation in Rel-18

- Taking Rel-17 SI/WI TU allocation for FR2-2 as the baseline and considering a more compact scope for further extension in Rel-18, following TU allocation is proposed
 - Assuming 18 months as tentative Rel-18 timeline (Jan 2022 – June 2023)

Topic	RAN1 TU Allocation					
	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2
Further Enhanced NR operation in FR2-2	0	1	2	2	2	2

thanks.

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Lenovo