3GPP TSG RAN WG1 #120 R1- 25xxxx

Athens, Greece, 17 – 21 February, 2025

Source: Moderator (Nokia)

Title: [120-Pre-R18-NR] Soft buffer for 1024QAM

Agenda Item: 7

Release: Release 17

WI code: NR\_DL1024QAM\_FR1-Core

Document for: Discussion and Decision

# Introduction

RAN1#119 introduced the issue of soft buffer size determination for rank-restricted UE with 1024QAM support [1]. The discussion was postponed to RAN1#120 to give companies more time to check the situation, where the resubmission of the same draft CR is to be discussed [2].

For 1024QAM, two UE capabilities were defined in Release 17:

***pdsch-1024QAM-FR1-r17***

Indicates whether the UE supports 1024QAM modulation scheme for PDSCH for FR1 as defined in TS 38.211 [6], MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214 [12].

***pdsch-1024QAM-2MIMO-FR1-r17***

Indicates whether the UE supports 1024QAM modulation scheme for PDSCH with maximum 2 MIMO layers for FR1 as defined in TS 38.211 [6], MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214 [12].

The TS38.212 calculation for soft buffer size doesn’t take the rank restricted UE type into account, but calculates the soft buffer size for LDPC bit selection according to the configured maximum modulation and configured maximum rank. However, the UE indicating *pdsch-1024QAM-2MIMO-FR1-r17* and being configured with maximum modulation of 1024QAM and with maximum rank > 2 will not use the maximum modulation and maximum rank at the same time as the maximum rank will be limited to 2 when 1024QAM tranmsision is used.

The proposed CR [1, 2] suggest to calculate the maximum soft buffer size for the rank-restricted 1024QAM UE applying the maximum TB size it actually is required to be able to process. Without this clarification it is not fully clear which soft-buffer size should be assumed in the rate matching for these UEs.

# Moderator proposal

The draft CR in [2] suggests applying the maximum TB size achievable as the soft buffer size calculation rather than separately considering the maximum rank and the maximum modulation order, so that the case where max rank 4 with 64QAM and max rank 2 with 1024QAM is taken into account.

**Proposal 1:**

Agree to the draft CR provided in [2]

**Please provide you views on the proposal above**

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| Company | Comments |
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# References

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| [1] | [R1-2410620](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_119/Docs/R1-2410620.zip) | Soft buffer size determination for 1024QAM rank restricted UE | Nokia |
| [2] | [R1-2501266](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_120/Docs/R1-2501266.zip) | Soft buffer size determination for 1024QAM rank restricted UE | Nokia |