**3GPP TSG RAN WG1 #110 R1-** **210xxxx**

**August 22nd – 26th, 2022**

**Agenda item:** 7.2.11

**Source:** Moderator (Qualcomm)

**Title:** Summary of Additional Capabilities for Span-Based PDCCH

**Document for:** Discussion and Decision

# 1 Introduction

This document summarizes companies views on introducing new patterns for span-based PDCCH as proposed in [1].

In R16, three different patterns for span-based PDCCH were introduced: (2,2), (4,3) and (7,3). In [1], it is mentioned that supporting the (2,2) pattern, where the UE has to monitor PDCCH effectively on every DL symbol, is challenging. Further, supporting (4,3) or (7,3), where the UE has monitor PDCCH over multiple groups of 3 consecutive symbols, is challenging. To facilitate the implementation of this feature for URLLC applications, it is therefore proposed to adopt additional, less demanding, patterns; these patterns are (2,1), (4,1) and (7,1).

It is therefore proposed to introduce a new FG, FG 11-2x as below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11-2x | Rel-16 PDCCH monitoring capability | 1.   Supported combination(s) of (X, Y, m). For each reported combination, the UE supports the limit C on the maximum number of non-overlapped CCEs for channel estimation per PDCCH monitoring span and the limit M on the maximum number of monitored PDCCH candidates per PDCCH monitoring span2.   Maximum number of DL and UL unicast DCI formats in a spanFor the set of monitoring occasions which are within the same span:-     Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per scheduled CC across this set of monitoring occasions for FDD-     Processing one unicast DCI scheduling DL and two unicast DCI scheduling UL per scheduled CC across this set of monitoring occasions for TDD-     Processing two unicast DCI scheduling DL and one unicast DCI scheduling UL per scheduled CC across this set of monitoring occasions for TDD |  | *pdcch-Monitoring-r16 {**pdsch-ProcessingType1-r16{**scs-15kHz-r16**PDCCH-MonitoringOccasions-r16,**scs-30kHz-r16**PDCCH-MonitoringOccasions-r16**},**pdsch-ProcessingType2-r16 {**scs-15kHz-r16**PDCCH-MonitoringOccasions-r16,**scs-30kHz-r16**PDCCH-MonitoringOccasions-r16**}* | *FeatureSetDownlink-v1610* | n/a | n/a | This capability is signalled for SCS 15 kHz and 30 kHz. For $μ$ =0 and 1, candidate value set for (X, Y, $μ$): {(7, 1, $μ$),  (4, 1, $μ$),  (2, 1, $μ$)} For component 1, a list of separate UE capabilities (X, Y, $μ$) for processing capability #1; For component 1, a list of separate UE capabilities (X, Y, $μ$) for processing capability #2;  | Optional with capability signalling |

It is further proposed to introduce mirrored version of FG 11-2a, 11-2b, 11-2c, 11-2d, 11-2e, 11-2f and 11-2g, where the prerequisite of FG 11-2 is replaced by FG 11-2x. Note that FG 11-2x can also be added to FG 11-2a, 11-2b, 11-2c, 11-2d, 11-2e, 11-2f and 11-2g as a prerequisite directly; however, the proposed approach above is to address any concern that may arise regarding backward compatibility.

# 2 Proposals and Summary of Views

**Question #1:** Do you agree to introduce a R16 FG 11-2x as proposed above to support (X,Y) = {(2,1),(4,1),(7,1)} span patterns? If you support only a subset of the patterns or would prefer to propose different ones, please include them in the table below.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
|  |  |  |
|  |  |  |

# 3 Summary

TBD

# 4 References

**[1] R1-2207172, “*Maintenance for R16 eURLLC*,” Qualcomm**