**3GPP TSG RAN WG1 #111 R1-2212529**

**Toulouse, France, November 14th – 18th, 2022**

Source: NTT DOCOMO, INC.

Title: Session Notes for R17 UE Features 1

Agenda Item: 8.16.1

**Document for:** **Discussion and Decision**

***8.16 Rel-17 UE features***

**8.16.1 UE features topics 1**

*For discussions on Rel-17 UE features for eIIoT & URLLC, RedCap, UE power saving, coverage enhancement, NB-IoT & eMTC, sidelink, MBS, 5G terrestrial broadcast, UL TX switching, SDT.*

[111-R17-UE\_features\_1] To be used for sharing updates on online/offline schedule, details on what is to be discussed in online/offline sessions, tdoc number of the moderator summary for online session, etc – Hiroki (DOCOMO)

R1-2212525 Summary#1 on UE features for NR coverage enhancement Moderator (NTT DOCOMO, INC.)

R1-2212526 Summary#1 on UE features for NR MBS Moderator (NTT DOCOMO, INC.)

**High priority proposal 2-1-1:**

**Signaling of FG 33-1 is revised to optional without capability signaling.**

**High priority proposal 2-2-1:**

**The reporting type of FG 33-1-1 is per FSPC.**

**High priority proposal 2-7-1:**

**Add a component that “Support of Type-2 HARQ-ACK codebook for multicast on PUSCH with max number X of G-RNTIs” to FG33-2a**

**Add a note that “the value of X should be common across FG33-2a, 33-3-3a and 33-3-3b” to FG33-2a, 33-3-3a and 33-3-3b**

Proposal

Modify FG33-3-3a and 3b as below

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| 33. NR\_MBS | 33-3-3a | FDM-ed Type-1 and Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast | 1. Support of FDM-ed Type-1 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number X of G-RNTIs | 33-3-3c, 33-2e | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: FDM-ed Type-1 HARQ-ACK codebook is generated by concatenating the Type-1 sub-codebook for unicast and the Type-1 sub-codebook for multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast.  Candidate values of X is {2, 3, 4} with X no larger than max number of G-RNTIs of FG33-2e | Optional with capability signalling |
| 33. NR\_MBS | 33-3-3b | Mode 2 TDM-ed Type-1 and Type-2 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast | 1. Support of Mode 2 TDM-ed Type-1 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number X of G-RNTIs | 33-3-3d, 33-2e | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: Mode 2 TDM-ed Type-1 HARQ-ACK codebook is generated based on the union TDRA tables from unicast and multicast and the union of k1 sets from unicast and multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast.  Candidate values of X is {2, 3, 4} with X no larger than max number of G-RNTIs of FG33-2e | Optional with capability signalling |

Proposal

Add new FGs as below

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 33. NR\_MBS | 33-3-3c | FDM-ed Type-1 and Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast | 1. Support of FDM-ed Type-1 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with 1 G-RNTI | 33-3-2, at least one of {33-2a, 33-4, 33-5-1a, 33-5-1f} | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: FDM-ed Type-1 HARQ-ACK codebook is generated by concatenating the Type-1 sub-codebook for unicast and the Type-1 sub-codebook for multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast. | Optional with capability signalling |
| 33. NR\_MBS | 33-3-3d | Mode 2 TDM-ed Type-1 and Type-2 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast | 1. Support of Mode 2 TDM-ed Type-1 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with 1 G-RNTI | 33-2a or 33-4 or 33-5-1a or 33-5-1f | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: Mode 2 TDM-ed Type-1 HARQ-ACK codebook is generated based on the union TDRA tables from unicast and multicast and the union of k1 sets from unicast and multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast. | Optional with capability signalling |

**High priority proposal 2-8-1:**

the reporting type of FG 33-3-5 is per BC

R1-2212527 Summary#1 on UE features for RedCap Moderator (NTT DOCOMO, INC.)

R1-2210986 Remaining issues on Rel-17 UE features (MBS) vivo

R1-2211041 Discussion on UE features for topics 1 ZTE

R1-2211069 Remaining issues for UE features topics 1 Nokia, Nokia Shanghai Bell

R1-2211893 Rel-17 UE features topics set #1 Ericsson

R1-2211968 Discussion on remaining issues regarding Rel-17 RAN1 UE features topics 1 NTT DOCOMO, INC.

R1-2212098 Discussion on Rel-17 UE features topic 1 Qualcomm Incorporated

R1-2212268 Views on UE feature Topic 1 MediaTek Inc.

R1-2212472 Remaining issues for UE features topics 1 Huawei, HiSilicon