**3GPP TSG RAN WG1 #101 R1-200xxxx**

**e-Meeting, May 25th – June 5th, 2020**

**Agenda Item: 7.2.11.7**

**Source: Moderator (AT&T)**

**Title: Summary of email discussion/approval [101-e-NR- UE\_pow\_sav-UEFeatures-03]**

**Document for:** **Discussion/Decision**

# Introduction

This document presents the summary of email discussion/approval [101-e-NR- UE\_pow\_sav-UEFeatures-03] during RAN1 #101-e. According to the Chairman’s Notes:

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| [101-e-NR- UE\_pow\_sav-UEFeatures-03] Email discussion/approval till 5/29 – Ralf (AT&T)   * Discuss whether updates to the agreed FG 19-2 are needed in order to introduce joint indication of minimumSchedulingOffsetK0 and minimumSchedulingOffsetK2 as new component   1. Note: updating the need for FRx differentiation for FG 19-2 is not in scope of any email discussion/approval for UE Power Saving during RAN1 #101-e |

The following was discussed and agreed during RAN1 #101-e within the scope of [101-e-NR- UE\_pow\_sav-UEFeatures-03].

# Summary of email discussion/approval [101-e-NR- UE\_pow\_sav-UEFeatures-03]

The following table represents the latest version of the NR UE feature list for UE power savings [1].

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | | Need for the gNB to know if the feature is supported | | Applicable to the capability signalling exchange between UEs (V2X WI only)”. | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Capability interpretation for mixture of FDD/TDD and/or FR1/FR2 | Note | Mandatory/Optional |
| 19.UE Power Saving | 19-1 | DRX Adaptation | 1. Configured PS\_offset for the detection of  DCI format 2\_6  with CRC scrambling by PS-RNTI and minimum time gap before DRX ON duration 2. Indication of UE whether  or not to start drx\_OnDuration timer at the DRX ON by detection of DCI format 2\_6 3. Configured UE wakeup or not when DCI format 2\_6 is not detected at all monitoring occasions outside Active time 4. Configured  P-CSI / L1-SINR report when  impacted by DCI format 2\_6 that drx\_OnDurationTimer does not start at the DRX ON 5. Configured  L1-RSRP report when  impacted by DCI format 2\_6 that drx\_OnDurationTimer does not start at the DRX ON | N/A | | Yes | | N/A |  | Per UE | No | Yes | N/A | The minimum time gap between the end of the slot of last DCI format 2\_6 monitoring occasion and the start of the DRX ON is a UE capability based on subcarrier spacing.   * The reporting is per SCS in units of slots of the respective SCS * The reported value for a SCS is taken from two possible values per SCS * The largest value of minimum time gap in UE capability is no more than the number of slots equal to 3 ms   UE is not required to monitor PDCCH for detection of DCI format 2\_6 during the minimum time gap  FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |
| 19-2 | Cross Slot Scheduling | (1)    Dynamic indication of applicable minimum scheduling restriction by  DCI format 0\_1 and 1\_1  minimumSchedulingOffset K0 configuration for PDSCH and aperiodic CSI-RS triggering offset  (2)    minimumSchedulingOffset K2 configuration for PUSCH | | N/A | | Yes | N/A | Dynamic adaptation of the minimum value of K0min/K2min for cross-slot scheduling is not supported | Per UE | No | No | N/A | FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |
| 19-3 | Maximum MIMO Layer Adaptation | 1. Support of maximum number of MIMO layer configuration  per DL BWP | | See Note | | Yes | N/A |  | [Per UE ] | No | [Yes] | N/A | This capability is indicated only if UE supports the network configuration of maxMIMO-Layers according to maxLayersMIMO-Indication  FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |
| 19-4a | UE assistance information | Support of reporting preferred minimum K0/K2 via UE assistance information   * 15kHz/30kHz SCS: {1, 2, 4, 6} slots * 60kHz/120kHz SCS: {2, 4, 8, 12} slots | | 19-2 | | Yes | N/A |  | Per UE | No | No | N/A | The minimum applicable value of K0 (K2) for an active DL (UL) BWP for the carrier where PDSCH(PUSCH) is transmitted  FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |

Companies are invited to provide their views on whether updates to the agreed FG 19-2 are needed in order to introduce joint indication of minimumSchedulingOffsetK0 and minimumSchedulingOffsetK2 as new component in the following table.

|  |  |
| --- | --- |
| Company | Comments/Questions/Suggestions |
| OPPO | There is no other option of the signaling for Component (1) (2) (3). To us, the (2) and (3) can be clearer to say “for power saving”. This will help. But indication of capable of Joint Indication is not needed. |
| CATT | There is no need to have joint indication since RRC parameters of minimumSchedulingOffsetK0 and minimumSchedulingOffsetK2 are separated configured in different IE. The FFS point could be removed. |
| Ericsson | First component already covers dynamic indication in the DCI. Then, the UE behavior when receiving the indication is clear from specification. So, new component is not needed. |
| Samsung | We agree with CATT. No new component is needed. |
| Qualcomm | Agreed with CATT and Ericsson. We don’t see any need for the new component. |
| ZTE | Agree with CATT that new component is not needed. |
| Panasonic | Joint indication of minimumSchedulingOffsetK0 and minimumSchedulingOffsetK2 itself would not be required.  Joint operation between cross-slot and cross-carrier needs some more clarification on the capability. |
| MediaTek | Agree with Ericsson that we don’t see the strong need to add new component. |
| Huawei, HiSilicon | According to the description in T 38.214, joint indication is essential for the cross-slot scheduling based power saving. Therefore we think the joint indication should be captured as a component. |
| Intel | New component is not needed |
| Apple | No need for a new component |

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# Conclusion

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# References

1. R1-2003195, Summary of Email Approval [100e-b-NR-UEFeatures-Remaining] — UE Power Saving Aspects, Moderator (AT&T)