**3GPP TSG RAN WG1 #102-e R1-200XXXX**

**e-Meeting, August 17th – 28th, 2020**

**Agenda item:** 7.1

**Source:** Moderator (CATT)

**Title:** Summary for [102-e-NR-7.1CRs-04] Correction on the definition for timeline condition

**Document for:** Discussion and Decision

# Introduction

This document is created to facilitate the email discussion “[102-e-NR-7.1CRs-04] Correction on the definition for timeline condition. This thread is triggered by Issue #10 of [1] and originates from draft CRs to TS38.213 in [2][3].

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| **Issue#** | **Tdoc#** | **Source** | **Issue description** |
| 10 | R1-2005660,  R1-2006069 | CATT, OPPO | Correction on the definition for timeline condition. Carry over from previous meeting. |

The same issue was initially brought up in R1-2000517 in RAN1#100-e meeting. The conclusion in the last meeting was to further discuss as follows.

[R1-2003592](file:///C:\Users\xingyanping\AppData\Local\Temp\Docs\R1-2003592.zip) Correction on the definition for timeline condition    CATT

For further discussion in future meeting(s)

# Company views

Please provide company’s view in the table below:

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | We are supportive of all the above changes. |
| Ericsson | We support the CR x5660 on all the changes above. |
| Samsung | -  is not before a symbol with CP starting after after a last symbol of any corresponding PDSCH, is given by maximum of where for the i-th PDSCH with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs and PUSCHs, , is selected for the i-th PDSCH following [6, TS 38.214], is selected based on the UE PDSCH processing capability of the i-th PDSCH and SCS configuration , where corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH scheduling the i-th PDSCH, the i-th PDSCH, the PUCCH with corresponding HARQ-ACK transmission for the i-th PDSCH, and all PUSCHs in the group of overlapping PUCCHs and PUSCHs.  -  is not before a symbol with CP starting after after a last symbol of any corresponding SPS PDSCH release. is given by maximum of where for the i-th PDCCH providing the SPS PDSCH release with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs and PUSCHs, , is described in Subclause 10.2 and is selected based on the UE PDSCH processing capability of the i-th SPS PDSCH release and SCS configuration , where corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH providing the i-th SPS PDSCH release, the PUCCH with corresponding HARQ-ACK transmission for the i-th SPS PDSCH release, and all PUSCHs in the group of overlapping PUCCHs and PUSCHs.  - if there is no aperiodic CSI report multiplexed in a PUSCH in the group of overlapping PUCCHs and PUSCHs,  is not before a symbol with CP starting after after a last symbol of  - any PDCCH with the DCI format scheduling an overlapping PUSCH, and  - any PDCCH scheduling a PDSCH or SPS PDSCH release with corresponding HARQ-ACK information in an overlapping PUCCH in the slot  If there is at least one PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PUSCH which is in the group of overlapping PUCCHs and PUSCHs, , and are selected for the i-th PUSCH following [6, TS 38.214], is selected based on the UE PUSCH processing capability of the i-th PUSCH and SCS configuration , where  corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH scheduling the i-th PUSCH, the PDCCHs scheduling the PDSCHs, or providing the SPS PDSCH release(s), with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs/PUSCHs, and all PUSCHs in the group of overlapping PUCCHs and PUSCHs.  If there is no PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PDSCH, or the i-th SPS PDSCH release with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs, , is selected based on the UE PUSCH processing capability of the PUCCH serving cell if configured.   is selected based on the UE PUSCH processing capability 1, if PUSCH processing capability is not configured for the PUCCH serving cell. is selected based on the smallest SCS configuration between the SCS configuration used for the PDCCH scheduling the i-th PDSCH, or providing the i-th SPS PDSCH release, with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs, and the SCS configuration for the PUCCH serving cell. |
| vivo | Fine with all changes in principle. For the 2nd change, is it better to remove “and SCS configuration μ”? |
| NTT DOCOMO | Support the CR x5660 |
| Qualcomm | We are supportive of the corrections.  Regarding the draft TPs from CATT and Samsung,   * For “and is selected based on the UE PDSCH processing capability of the i-th SPS PDSCH release”, we prefer to adopt CATT’s change as it is more accurate. * For other changes, we prefer to adopt Samsung’s suggestions. They are essentially equivalent, but Samsung’s TP is simpler and cleaner. |
| Huawei, HiSilicon | We are supportive of the corrections in the x5660 except to add the “if any” in bracket, it is understood when there is no such transmission/reception, corresponding SCS is not applied, so it is not necessary to add the “if any” every possible channels. |
| Apple | We are fine with the draft TPs from CATT; except that we prefer not to take the change from “In the second bullet of timeline condition definition, it is not clear what ‘the UE PDSCH processing capability of the i-th SPS PDSCH release’ is. Since there is no such definition in the specification and the definition of N for the i-th SPS PDSCH release is directly defined in clause 10.2 based on the configuration of PDSCH processing capability, it is sufficient to refer to section 10.2 only without defining ‘the UE PDSCH processing capability of the i-th SPS PDSCH release’.”. If the wording in the specification needs to be fixed, we are open to that. |
| CATT | The following updated TP (highlighted in yellow) is proposed based on the above comments including:   1. “(if any)”s are removed with the understanding that if there is no such transmission/reception, the corresponding parameter does not apply based on Samsung’s comments; 2. The parentheses in PDCCH(s) and PDSCH(s) are removed with the understanding that a single PDCCH and PDSCH is included based on Samsung’s comments; 3. “and SCS configuration μ” in the second bullet is removed based on vivo’s comments; 4. In bullet 3, the PDCCH providing SPS PDSCH release is merged with PDCCH scheduling PDSCHs based on Samsung’s comments   -  is not before a symbol with CP starting after after a last symbol of any corresponding PDSCH, is given by maximum of where for the i-th PDSCH with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs and PUSCHs, , is selected for the i-th PDSCH following [6, TS 38.214], is selected based on the UE PDSCH processing capability of the i-th PDSCH and SCS configuration , where corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH scheduling the i-th PDSCH ~~(if any)~~, the i-th PDSCH, the PUCCH with corresponding HARQ-ACK transmission for the i-th PDSCH, and all PUSCHs ~~(if any)~~ in the group of overlapping PUCCHs and PUSCHs.  -  is not before a symbol with CP starting after after a last symbol of any corresponding SPS PDSCH release. is given by maximum of where for the i-th PDCCH providing the SPS PDSCH release with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs and PUSCHs, , is described in Subclause 10.2 ~~and is selected based on the UE PDSCH processing capability of the i-th SPS PDSCH release and SCS configuration~~ , where corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH providing the i-th SPS PDSCH release, the PUCCH with corresponding HARQ-ACK transmission for the i-th SPS PDSCH release, and all PUSCHs ~~(if any)~~ in the group of overlapping PUCCHs and PUSCHs.  - if there is no aperiodic CSI report multiplexed in a PUSCH in the group of overlapping PUCCHs and PUSCHs,  is not before a symbol with CP starting after after a last symbol of  - any PDCCH with the DCI format scheduling an overlapping PUSCH, and  - any PDCCH scheduling a PDSCH or SPS PDSCH release with corresponding HARQ-ACK information in an overlapping PUCCH in the slot  If there is at least one PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PUSCH which is in the group of overlapping PUCCHs and PUSCHs, , and are selected for the i-th PUSCH following [6, TS 38.214], is selected based on the UE PUSCH processing capability of the i-th PUSCH and SCS configuration , where corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH scheduling the i-th PUSCH ~~(if any)~~, the PDCCH~~(~~s~~)~~ scheduling the PDSCH~~(~~s~~)~~ ~~(if any)~~ or providing the SPS PDSCH releases, with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs/PUSCHs, ~~the PDCCH(s) providing the SPS PDSCH release(s) (if any) with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs/PUSCHs,~~ and all PUSCHs in the group of overlapping PUCCHs and PUSCHs.  If there is no PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PDSCH or the i-th SPS PDSCH release with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs, , is selected based on the UE PUSCH processing capability of the PUCCH serving cell if configured.   is selected based on the UE PUSCH processing capability 1, if PUSCH processing capability is not configured for the PUCCH serving cell. is selected based on the smallest SCS configuration between the SCS configuration used for the PDCCH scheduling the i-th PDSCH ~~(if any)~~ or ~~the PDCCH~~ providing the i-th SPS PDSCH release ~~(if any)~~ with corresponding HARQ-ACK transmission on a PUCCH which is in the group of overlapping PUCCHs, and the SCS configuration for the PUCCH serving cell.  - if there is an aperiodic CSI report multiplexed in a PUSCH in the group of overlapping PUCCHs and PUSCHs,  is not before a symbol with CP starting after  after a last symbol of  - any PDCCH with the DCI format scheduling an overlapping PUSCH, and  - any PDCCH scheduling a PDSCH or SPS PDSCH release with corresponding HARQ-ACK information in an overlapping PUCCH in the slot  where corresponds to the smallest SCS configuration among the SCS configuration of the PDCCHs, the smallest SCS configuration for the group of the overlapping PUSCHs, and the smallest SCS configuration of CSI-RS associated with the DCI format scheduling the PUSCH with the multiplexed aperiodic CSI report, and  for ,  for  and  for  - , , , , , and  are defined in [6, TS 38.214], and  and  are defined in [4, TS 38.211].  If a UE would transmit multiple overlapping PUCCHs in a slot or overlapping PUCCH(s) and PUSCH(s) in a slot, one of the PUCCHs includes HARQ-ACK information in response to an SPS PDSCH reception, and any PUSCH is not in response to a DCI format detection, the UE expects that the first symbol  of the earliest PUCCH or PUSCH satisfies the first of the previous timeline conditions with the exception that components associated to a SCS configuration for a PDCCH scheduling a PDSCH or a PUSCH are absent from the timeline conditions.  A UE does not expect a PUCCH or a PUSCH that is in response to a DCI format detection to overlap with any other PUCCH or PUSCH that does not satisfy the above timing conditions.  If there is one or more aperiodic CSI reports multiplexed on a PUSCH~~s~~ in the group of overlapping PUCCHs and PUSCHs and if symbol  is before symbol  that is a next uplink symbol with CP starting after  after the end of the last symbol of  - the last symbol of aperiodic CSI-RS resource for channel measurements, and  - the last symbol of aperiodic CSI-IM used for interference measurements, and  - the last symbol of aperiodic NZP CSI-RS for interference measurements, when aperiodic CSI-RS is used for channel measurement for triggered CSI report  the UE is not required to update the CSI report for the triggered CSI report *.* is defined in [6, TS 38.214] and corresponds to the smallest SCS configuration among the SCS configurations of the PDCCHs scheduling the PUSCHs, the smallest SCS configuration of aperiodic CSI-RSs associated with DCI formats provided by the PDCCHs triggering the aperiodic CSI reports, and the smallest SCS configuration of the overlapping PUCCHs and PUSCHs and  for ,  for  and  for . |

# Conclusion

To be added after the discussion.

# Reference

1. [R1-2006958](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Inbox/R1-2006958.zip), RAN1#102-e preparation phase on NR Rel-15 CRs, Ad-hoc chair (Samsung)
2. R1-2005660, Correction on the definition for timeline condition, CATT, RAN1#102-e
3. R1-2006069, Correction on UCI multiplexing timeline, OPPO, RAN1#102-e