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

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

**Agenda item:** 7.1

**Source:** Moderator (Nokia)

**Title:** Summary for [102-e-NR-7.1CRs-18] “Clarification on which UE capability component indicates the number of supported simultaneous CSI calculations $N\_{CPU}$” (Issue #16)

**Document for:** Discussion and Decision

# Introduction

This document is created to facilitate the email discussion [102-e-NR-7.1CRs-18] “Clarification on which UE capability component indicates the number of supported simultaneous CSI calculations N\_CPU”. This thread is triggered by Issue #16 of [1] and originates from a draft CR to TS38.214 in [2].

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| **Issue#** | **Tdoc#** | **Source** | **Issue description** |
| 16 | R1-2006851 | Nokia, NSB | Clarification on which UE capability component indicates the number of supported simultaneous CSI calculations N\_CPU. Carry over from previous meeting. |

# Company views

Please provide company’s view in the table below:

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| **Company** | **View** |
| Nokia/NSB | In subclause 5.2.1.6 of TS38.214, the parameter $N\_{CPU}$ is defined as the number of simultaneous CSI calculations supported by a UE. The text specifies that this parameter is indicated by the UE, but it is not clear which UE capability component indicates it and that the indication is given per-CC as well as across all active CCs.Without this clarification, a UE may report the maximum supported number of simultaneous CSI reports in *simultaneousCSI-ReportsPerCC* and *simultaneousCSI-ReportsAllCC,* instead of the maximum number of CPUs, which creates an underreporting problem because one CSI report can occupy multiple CPUs. |
| Qualcomm | Additionally clarify that per-CC capability is “hard restriction”, while across-all-CC capability is a “soft restriction” – It means that gNB can configure/trigger >N\_CPU across all CCs, UE just do not update the CSI who exceeds the limit.Modified text proposal:“UE indicates the number of supported simultaneous CSI calculations $N\_{CPU}^{'}$ with parameter simultaneousCSI-ReportsPerCC in a component carrier, and $N\_{CPU}$ simultaneousCSI-ReportsAllCC across all component carriers. A UE does not expect to have more than $N\_{CPU}^{'}$ simultaneous CSI calculations on each component carrier. If a UE supports $N\_{CPU}$ simultaneous CSI calculations it is said to have $N\_{CPU}$ CSI processing units for processing CSI reports across all configured cells.” |
| Huawei/HiSilicon | With regarding to newly suggested change, “A UE does not expect to have more than N\_CPU^' simultaneous CSI calculations on each component carrier”, it actually means new gNB implementation restriction on top of Rel-15 spec. At least in our understanding, all priority of CSI reporting (if gNB triggering CSI reports exceed N\_CPU) shall apply to per CC and across CCs simultaneously so that the UE will provide non-updated report(s) to the gNB per CC and also across CCs. Spec has defined a series of clarifications how to rank CSI reports per CC and across CCs. Therefore, would original text proposal from Nokia may be sufficient enough? |
| ZTE | Similar understanding as Huawei. Based on the previous text from Nokia, it means the specified rules for Rel-15 apply on both N\_CPU per CC and N\_CPU across all CCs. However, the new text from Qualcomm means those rules only apply on N\_CPU across all CCs, and there should be a new rule for per CC restriction of N'\_CPU, which can be NBC. Hence, we think it is better to keep the original text from Nokia, as we don't want to introduce new behavior at such late stage. |
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# 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. [R1-2006851](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_102-e/Docs/R1-2006851.zip) 38.214CRdraft (Rel-15, F) Clarification on which UE capability component indicates the number of supported simultaneous CSI calculations $N\_{CPU}$, Nokia, Nokia Shanghai Bell