TSG-RAN WG1 #112b-e R1-23xxxxx

e-meeting, April 17 – 26, 2023

Source: Nokia

Title: Draft CR 38.214 – TEI18

Agenda Item: 9.18

Document for: Discussion and Decision

# Introduction

This thread will discuss the potential need for a draft CR to 38.214 for TEI18.

A first item where I would appreciate companies’ feedback is related to *Introduction of additional PRS configurations*.

First checkpoint for this discussion: **April 20, UTC 17.00!**

# Discussion – first round

To my knowledge, there is the following RAN1 agreement:

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| **Agreement**Introduce 1-symbol PRS with legacy comb sizes. * **UE expects the suitable expected RSTD windows provided by LMF such that peak ambiguity is addressed. Otherwise no measurement accuracy requirements are expected to be met.**
* Not to define RAN4 RRM requirement, including core/performance in Rel-18
* Send an LS to RAN2 and RAN3 to ask necessary signalling enhancements
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| Company | Comments | Editor reply/Notes |
| Nokia/Editor  | I look forward to hearing your views on the bold font phrase in the agreement above! In my view this is not necessarily needed in 38.214 as: 1. We need to see what RAN4 is going to do about this issue, 2. A specification change may be seen as covering an error case as we will of course expect a valid configuration to happen to the UE, configuration which will be according to some procedure (not specified in 38.214).  |  |
| ZTE | **Comment 1:** We support adding the bold font phrase in 38.214 as this is an agreement and no RAN4 requirement is expected. **Comment 2:** The symbol offset 13 is naturally being supported for 1-symbol PRS. Based on the current ASN.1, the existing higher layer parameters can be extended to support the number of PRS symbols = 1 because the existing parameters in 37.355 and 38.331 are extendable. However, for the symbol offset parameters, the existing parameters are not extendable, so new parameters should be introduced. The following change is suggested:*- dl-PRS-NumSymbols* defines the number of symbols of the DL PRS resource within a slot where the allowable values are given in Clause 7.4.1.7.3 of [4, TS38.211]. When *dl-PRS-NumSymbols* equals 1, UE expects the suitable expected RSTD windows provided by LMF such that peak ambiguity is addressed.A DL PRS resource is defined by:*- nr-DL-PRS-ResourceID* determines the DL PRS resource configuration identity. All DL PRS resource IDs are locally defined within a DL PRS resource set.*- dl-PRS-SequenceID* is used to initialize cinit value used in pseudo random generator as described in Clause 7.4.1.7.2 of [4, TS 38.211] for generation of DL PRS sequence for a given DL PRS resource.*- dl-PRS-CombSizeN-AndReOffset* defines the starting RE offset of the first symbol within a DL PRS resource in frequency. The relative RE offsets of the remaining symbols within a DL PRS resource are defined based on the initial offset and the rule described in Clause 7.4.1.7.3 of [4, TS 38.211]. *- dl-PRS-ResourceSlotOffset* determines the starting slot of the DL PRS resource with respect to corresponding DL PRS resource set slot offset.*- dl-PRS-ResourceSymbolOffset [or dl-PRS-ResourceSymbolOffset-r18] d*etermines the starting symbol of a slot configured with the DL PRS resource.**Comment 3:** If a CR is needed, according to the TEI guidance as follows, a unique TEI identifier should be used across the WGs. Since our RAN2/3 colleagues will use [1symbol\_PRS] as the identifier. Can I suggest to use the same one in RAN1 spec?

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| **E.2 Each TEI cat.B/C CR and each TEI cat.F/A CR that corrects functionality related to an earlier TEI cat.B/C CR shall have a unique TEI identifier in square brackets [ ] at the end of the CR title on the CR cover sheet. TEI cat.B/C CRs without such a unique TEI identifier cannot be approved at RAN.**This principle was endorsed in RP-202867 [7] and further guidance for this approach is provided here:- The TEI identifier should be short (4 to 18 characters using letters and/or digits or using \_ or - but avoiding blanks or other special characters which will complicate searches) and characterize the CR.- The originating company takes care that related CRs in other WGs use the same TEI identifier.- Unique identifiers are not added retroactively: Cat.F/A CRs for TEIs which did not have a unique identifier by RAN #91e will not get a unique identifier.- Apart from plain TEI CRs, the unique TEI identifiers shall also be applied to NR\_newRAT-Core, TEIxx CRs because NR\_newRAT-Core was the huge WI for 5G.- As the unique idendifiers are part of the CR title, they will be automatically stored in the CR database. Therefore CR authors have to make sure that the complete CR title in 3GU is in line with the title on the CR cover.- For cases where it is not 100% clear whether a linked CR was agreed in another WG, it is the task of the CR author to double-check the situation in the week after the WG meeting and to inform MCC in case any updates of CR titles are required otherwise they risk that not properly linked CRs are rejected at RAN level. |

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| Qualcomm | We support capturing the sentence in bolt since it gives a clear guidance to the LMF and the UE’s implementation. If the search window is not appropriately small, then there can be multiple LOS peaks inside the search window, a behavior that is no supposed to happen (starting from rel-16’s fully-staggered PRS). Using a 1-symbol comb-N pattern can result to N peaks even in AWGN channel, and if the search window is not small enough, it will result to ambiguity from UE’s side without UE’s fault. Part of the compromise when introducing a 1-symbol PRS symbol is that it will be network responsibility to set an appropriate window. We are fine to work on the wording to be more precise. A few examples we could start with are the following (we are obviously open to other examples): * When dl-PRS -NumSymbols equals 1 with a comb size of $K\_{comb}^{PRS}$, the UE expects a suitable nr-DL-PRS -ExpectedRSTD and nr-DL-PRS -ExpectedRSTD-Uncertainty configuration
	+ Example 1: such that peak ambiguity is addressed.
	+ Example 2: such that first path peak ambiguity is addressed.
	+ Example 3: such that the width of the search window is no more than $\frac{1}{K\_{comb}^{PRS}}$ of the OFDM symbol duration.
	+ Example 4: Such that no more than one path of the first arrival path is expected to be measured within the search window
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| Huawei, HiSilicon | We agree with editor’s evaluation. |  |
| Qualcomm2 | It is rather unfortunate that the statement (which is not a “note”) is suggested to not be captured.It is related to UE implementation and it is not just a network error. There is nothing “erroneous” or misconfiguration, it was however a statement that was added to reduce the UE implementation changes needed to support 1-symbol PRS vs the legacy patterns. For us it clearly needs to be captured, especially because it was part of the compromise of accepting this TEI. Note that this feature, i.e. unstaggered PRS, was explicitly precluded in earlier releases for the same reason, and we accepted to be added under the constraint written in the subbulet. We have added at least 4 proposals with potential texts and we would like to ask companies to be constructive. A fifth approach/proposal is to send an LS to RAN4 with the above agreement and suggest them to capture such statement in their specification.  |  |