**3GPP TSG RAN WG1 #100bis-e R1-20xxxxx**

**e-Meeting, 20th – 30th April, 2020**

**Agenda item:** 7.2.11

**Source:** Moderator (NTT DOCOMO, INC.)

**Title:** Summary on email discussion [100b-e-NR-UEFeatures-Remaining] NR\_CLI\_RIM

**Document for:** Discussion and Decision

1. Introduction

This contribution summarizes the following email discussion in AI 7.2.11 regarding Rel-16 NR UE features.

[100b-e-NR-UEFeatures-Remaining] Email discussion/approval of remaining issues (especially the one identified as low priority items in FL’s summaries) starting no earlier than 4/30 till next meeting – Hiroki (DCM)/Ralf (ATT)

Companies are encouraged to check further updates for UE features list based on R1-2003073 shown below and provide feedback if any. Please note that the target of this email discussion is to reflect agreeable updates rather than solving any controversial discussion point. If there is any controversial discussion point, it should be discussed in the next RAN1 meeting.

1. NR\_CLI\_RIM

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| **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****( 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** |
| 17. NR\_CLI\_RIM | 17-1 | CLI-RSSI measurement | 1. Support CLI-RSSI measurement. The max number of resources across all CCs configured to measure RSSI shall not exceed 64.2. Maximum number of measurement resources configured for CLI-RSSI measurement |  | Yes | N/A |  | Per UE | No (TDD only) | Yes | N/A | Candidate values for component 2 are {8, 16, 32, 64}.FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |
| 17. NR\_CLI\_RIM | 17-2 | SRS-RSRP measurement | 1. Support SRS-RSRP measurement. The max number of SRS resources across all CCs configured to measure SRS-RSRP shall not exceed 32.2. Maximum number of measurement resources configured for SRS-RSRP measurement3. Maximum number of measurement resources configured for SRS-RSRP measurement within a slot |  | Yes | N/A |  | Per UE | No (TDD only) | Yes | N/A | Candidate values for component 2 are {4, 8, 16, 32}.Candidate values for component 3 are {2, 4, 8}.FFS: whether or how to handle licensed/unlicensed differentiation | Optional with capability signalling |
| 17. NR\_CLI\_RIM | 17-3 | Simultaneous reception of DL signals/channels and CLI-RSSI measurement resource | Support simultaneous reception of DL signals/channels and CLI-RSSI measurement resource | 17-1 | Yes | N/A |  | Per UE | No (TDD only) | Yes | N/A | [UE shall prioritize CLI-RSSI measurement when simultaneous reception of DL signals/channels and CLI-RSSI measurement resource is not supported.] | Optional with capability signalling |
| 17. NR\_CLI\_RIM | 17-4 | Simultaneous reception of DL signals/channels and SRS-RSRP measurement resource | Support simultaneous reception of DL signals/channels and SRS-RSRP measurement resource | 17-2 | Yes | N/A |  | Per UE | No (TDD only) | Yes | N/A | [UE shall prioritize SRS-RSRP measurement when simultaneous reception of DL signals/channels and SRS-RSRP measurement resource is not supported.] | Optional with capability signalling |

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| Company | Comment |
| Nokia, NSB | We support the proposals in the table above.Regarding to FFS in 17-1/2, the features have been specified without consideration of unlicensed operation. More discussion is needed on the need for licensed/unlicensed differentiation.  |
| Intel | We support the UE features listed above. However, the word “simultaneously” should be removed from 17-1 component 1 and 17-2 component 1 to avoid confusion.The constraint on maximum number of CLI measurement resources is not for the resources to be measured **simultaneously** by a UE. |
| ZTE | (1)Firstly, we agree with Intel to delete “simultaneously” from 17-1 component 1 and 17-2 component 1. The agreements copied below limit the maximum numbers of CLI-RSSI and SRS-RSRP measurement resources to 64 and 32 respectively, but there is no “simultaneously” restriction. Furthermore, in 17-2 component 3, maximum number of SRS-RSRP measurement resources within a slot is {2, 4, 8}, thus it is useless to restrict the max number of SRS resources across all CCs configured to measure SRS-RSRP simultaneously shall not exceed 32. Agreements reached in RAN1 #AH\_1901 in Jan. 2019* For SRS-RSRP:
	+ The number of SRS to be monitored by the UE should not exceed 8 within a slot
		- Network may configure more than 8 SRSs over different slots

Agreements reached in RAN1 #96 in Feb. 2019* One or multiple resources for CLI-RSSI measurement can be configured
	+ Maximum number of measurement resource for CLI-RSSI measurement is 64.
* For SRS-RSRP, the total number of SRS resources to be monitored by a UE should not exceed 32.
1. For FFS in 17-1/2, supporting UE CLI features in unlicensed spectrum may help to solve hidden problem and perform flexible DL/UL scheduling. But whether licensed/unlicensed differentiation is needed or not requires further discussion.
2. A typo is found in the first column of FG17-3/4. “NR\_CLI\_RIM I” should be “NR\_CLI\_RIM”
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| Huawei, HiSilicon | * Agree with Intel and ZTE to delete “simultaneously” from component 1 of both 17-1 and 17-2.
* Since 17-3 and 17-4 are to be introduced, instead of a note in 17-3/4, the content of R1-2001523 should be captured in both 17-1 and 17-2 as part of component 1, making them more self-contained, e.g.

17-1: 1. Support CLI-RSSI measurement. The max number of resources across all CCs configured to measure RSSI simultaneously shall not exceed 64. UE shall prioritize the DL transmission in case DL signal/channel and CLI RSSI resources are FDMed.17-2: 1. Support SRS-RSRP measurement. The max number of SRS resources across all CCs configured to measure SRS-RSRP simultaneously shall not exceed 32. UE shall prioritize the DL transmission in case DL signal/channel and SRS RSRP resources are FDMed.RAN4 LS has been confirmed by RAN2:[R2-2002528](file:///C%3A%5CData%5C3GPP%5CExtracts%5CR2-2002528_R4-2002221.doc) Reply LS on CLI measurement capability (R4-2002221; contact: Huawei) RAN4 LS in Rel-16 NR\_CLI\_RIM-Core To:RAN2 Cc:RAN1* Ericsson and QC are fine with the indication from RAN4 and then revert the RAN2 agreement.
* We revert our previous agreement, i.e. we follow RAN4 decision. No update is anticipated to our specs for this.

<https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Inbox/Chairmans_Notes/RAN2-109bis-e-SRVCC-CLI-PRN-eMIMO-RACS_final.docx>* Regarding the FFS about unlicensed, more discussions are expected before any conclusion.
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| MTK | * We support the proposals in the table. We think it’s fine to keep the notes in 17-3 and 17-4.
* Agree with Intel/ZTE/HW to delete “simultaneously” from component 1 of both 17-1 and 17-2. This is also the consensus achieved in RAN1 100-bis-e.
* Regarding the FFS about unlicensed operation, more discussions are expected before decision.
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| Qualcomm | * We support to keep FG 17-3 and FG 17-4, given that the conflict between RAN2 and RAN4 agreeemnts have been resolved by RAN2 reverting their agreements of prioritizing serving cell channel/signal when it collides with CLI measurement resource. It’s fine to keep the notes in 17-3 and 17-4.
* Regariding the differentiation of licneced and unlincend support of CLI, all these FGs should be per band because it is unlikely that the feature would be introduced at the same time for licensed and unlicensed, while IODT differentiation is necessary. Per band signaling enables deployment in unlicensed without being tested in licensed and vice versa.
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| Moderator (NTT DOCOMO) | It seems that proposed updates are agreeable.In addition, the deletion of “simultanously” from FG17-1/2 component 1 description would also be fine according to feedbacks.FFS point regarding licensed/unlicensed differentiation for FG17-1/2 should be discussed in next meeting. |
| OPPO | We support to delete “simultaneously” in both FG 17-1/2The description in FG -3 and 4 can be kept in “Note”, which is preferred.The FFS part need more discussion is needed. |
| Moderator (NTT DOCOMO) | Based on futher feedbacks, I’d like to confirm that notes for FG17-3/4 are kept in “note” column. |
| Huawei, HiSilicon | OK with the latest proposals but not OK with 17-3 and 17-4 if the following changes cannot be acceptedAs commented before, 17-1 and 17-2 should be self-contained and the introduction of 17-3 and 17-4 should not be contradicted with RAN4 and RAN2 latest agreements. Currently the notes for 17-3 and 17-4 are not correct, changes are proposed:17-1: add note or a component that UE shall prioritize the DL transmission in case DL signal/channel and CLI RSSI resources are FDMed (if 17-3 is not reported).17-2: add note or a component that UE shall prioritize the DL transmission in case DL signal/channel and SRS RSRP resources are FDMed. (if 17-4 is not reported).17-3, 17-4: delete the wrong notes accordingly. |
| Moderator (NTT DOCOMO) | Add brackets for notes in 17-3/4 for further discussion |