**3GPP TSG-RAN WG2 Meeting #109-e-bis R2-200xxxx**

**Electronic meeting, 20 – 30 Apr 2020**

**Title:** [DRAFT]LS on Conflicting configurations

**Response to:**

**Release:** Rel-16

**Work Item:** NR\_L1enh\_URLLC-Core, NR\_eMIMO-Core, NR\_unlic-Core, others?

**Source:** [Huawei, to be changed to RAN2]

**To:** RAN1

**CC:**

**Contact Person:**

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**Attachments:** None

**1. Overall Description:**

For Rel-16 features, for each IE, RAN2 intends to use a common structure to include all Rel-16 parameters and future extensions in later releases so that RRC ASN.1 can configure all combinations (e.g., dmrs-UplinkTransformPrecoding-r16 can be configured in UL DMRS for DCI format 0-2).

Any restriction should be captured explicitly in RAN1 and/or RAN2 specifications.

Note that for Rel-15 features, RAN2 assumes that, unless specifically requested by RAN1, there is no need to support Rel-16 extensions for other existing Rel-15 features (e.g., no need to configure dmrs-UplinkTransformPrecoding-r16 in UL DMRS for configured grant).

RAN2 would like to know whether the following Rel-16 features can be freely configured together or what the restrictions to be captured are:

**1)** **dmrs-UplinkTransformPrecoding-r16**

dmrs-UplinkTransformPrecoding-r16 is in the IE DMRS-UplinkConfig and is optional with the condition that "tp-pi2BPSK is included in PUSCH-Config". DMRS-UplinkConfig is use for several fields:

- in PUSCH-Config: dmrs-UplinkForPUSCH-MappingTypeA/B and dmrs-UplinkForPUSCH-MappingTypeA/B-ForDCI-Format0-2-r16

- in ConfiguredGrantConfig: for cg-DMRS-Configuration

**Q1-1**) Can dmrs-UplinkTransformPrecoding-r16 be configured for DCI format 0-2?

**Q1-2**) Is it possible to configure dmrs-UplinkTransformPrecoding-r16 independently for each mapping type of DCI formats other than 0-2 and for each mapping type of DCI format 0-2 (if the answer to Q1-2 is "yes") or what are the restrictions?

**2) dmrs-Downlink-r16**

dmrs-Downlink-r16 is in DMRS-DownlinkConfig which is used for several fields in PDSCH-Config: dmrs-DownlinkForPDSCH-MappingTypeA/B and dmrs-DownlinkForPDSCH-MappingTypeA/BForDCI-Format1-2-r16.

DCI format 1-2 is introduced in URLLC WI but dmrs-Downlink-r16 is introduced in MIMO WI.

**Q2-1**) Can dmrs-Downlink-r16 be used for DCI format 1-2?

**Q2-2**) Is it possible to configure dmrs-Downlink-r16 independently for each mapping type of DCI formats other than 1-2 and for each mapping type of DCI format 1-2 (if the answer to Q2-1 is "yes") or what are the restrictions?

**3)** **PDSCH time domain resource allocation**

PDSCH-TimeDomainResourceAllocation can be configured with repetitionNumber. Meanwhile, pdsch-TimeDomainAllocationListForDCI-Format1-2-r16 was introduced in PDSCH-Config.

**Q3-1**) Can the PDSCH time domain resource allocation for DCI format 1-2 support the use of repetitionNumber?

**Q3-2**) If the answer to Q3-1 is yes, can repetitionNumber be configured in the PDSCH time domain resource allocation for DCI format 1-2 if it is not configured in the time domain resource allocation for other DCI formats (and vice-versa), or should it be configured in the PDSCH time domain resource allocation for all DCI formats or for none?

**4)** **PUSCH time domain resource allocation**

For **URLLC,** a new Rel-16 IE, PUSCH-TimeDomainResourceAllocationNew-r16 (name will have to be changed to avoid "New"), was defined which includes the parameters of PUSCH-TimeDomainResourceAllocation plus startSymbol, length and numberOfRepetitions. In addition, mappingType and startSymbolAndLength, which were mandatory in the Rel-15 IE PUSCH-TimeDomainResourceAllocationList, are optional in the Rel-16 IE.

For **NR-U**, a new Rel-16 IE, PUSCH-TimeDomainResourceAllocation (name will have to be changed as well), was defined (in this meeting, so not in 38.331 v 16.0.0) which includes multiplePUSCH-Allocations where each allocation is defined by mappingType and startSymbolAndLength.

The new URLLC Rel-16 IE is used in PUSCH-Config for pusch-TimeDomainAllocationListForDCI-Format0-2-r16 and pusch-TimeDomainAllocationListForDCI-Format0-1-r16.

The Rel-15 version PUSCH-TimeDomainResourceAllocationList is used for pusch-TimeDomainAllocationList in PUSCH-Config and pusch-TimeDomainAllocationList in PUSCH-ConfigCommon.

**Q4-1)** Can the multiplePUSCH-Allocations (introduced for NR-U) and startSymbol, length and numberOfRepetitions (introduced for URLLC) be configured in the same PUSCH time domain resource allocation table, used for one of the 2 above underlined fields?

**Q4-2)** Can the multiplePUSCH-Allocations (introduced for NR-U) be used for one of the 2 above underlined fields while startSymbol, length and numberOfRepetitions (introduced for URLLC) are used in another of the above underlined fields?

In Q4-3 and Q4-4, if the answer is "yes", please indicate all the associated restrictions if any.

**5)** **DCI format 1\_2 applicability to features introduced in NR\_eMIMO WI**

The IE ControlResourceSet includes both tci-PresentInDCI and tci-PresentInDCI-ForDCI-Format1-2. Currently both parameters can be configured in all or some CORESETs of the UE and these CORESETs may be configured with CORESETPoolIndex (mPDCCH mTRP). Further, eMIMO WI introduced a new TCI state mapping MAC CE in TS 38.321 6.1.3.24 where two TCI states can be mapped to one DCI codepoint. Currently, there is no limitation which DCI format this new MAC CE in TS 38.321 6.1.3.24 applies to.

**Q5-1)** Can the UE be configured with both DCI format 1\_1 and DCI format 1\_2 with TCI field, either in the same or different CORESETs? And can the value of tci-PresentInDCI-ForDCI-Format1-2 be different in different CORESETs?

**Q5-2)** Can the UE be configured with mPDCCH mTRP (have at least on CORESET with CORESETPoolIndex=1) and the parameter tci-PresentInDCI-ForDCI-Format1-2?

**Q5-3)** Does the Enhanced TCI state MAC CE in TS 38.321 6.1.3.24 apply to DCI1\_2?

**6)** [Add more here if needed]

**2. Actions:**

**To RAN1:**

**ACTION:** RAN2 respectfully asks RAN1 to answer the above questions, which are necessary for RAN2 to complete the ASN.1 review of TS 38.331.

**3. Date of Next TSG-RAN WG2 Meetings:**

RAN2#110-e 01-12, June, 2020 Online

RAN2#111 24-28, August, 2020 Toulouse, France