3GPP TSG RAN WG2 #131 R2-250

**Bengaluru, India Aug 25th – 29th, 2025**

Title: Draft LS on per band and per BC capability

Response to: -

Release: Release 19

Work Item: NR\_MIMO\_Ph5, NR\_AIML\_air

Source: Samsung, Xiaomi [to be RAN WG2]

To: RAN WG1

Cc: -

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Attachments: -

**1. Overall Description:**

RAN2 observed that many feature groups are defined as “per band and per BC” in Rel-19 feature list and identified that there are some unclear aspects in specifying “per band and per BC capability”.

**Question 1:** what is the relationship between per band and per BC capabilities i.e. what is the final capability 1) when UE indicates both per band and per BC capability and 2) when per BC capability is indicated but one of bands in the BC doesn’t indicate per band capability.

In 59-2-1-1, component 4 is Max # of CSI-RS resource in a resource set (candidate value is {1..8}). Assuming the following capability indicated, what is Maximum # of CSI-RS resource in a resource set in band 1 and band 2 in CA\_n1\_n2?

* Band 1: Max # of CSI-RS resource in a resource set = 4
* Band 2: Max # of CSI-RS resource in a resource set = 8
* CA\_n1\_n2: Max # of CSI-RS resource in a resource set = 6

In 59-2-1-1, component 5 is Supported processing capability (candidate value {Capability 1, Capability 2}). Assuming the following capability indicated, what is actual supported processing capability in band 1 and band 2 in CA\_n1\_n2?

* Band 1: Capability 1
* Band 2: Capability 2
* CA\_n1\_n2: Capability 1

For this question, we included the following two examples.

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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 (Sidelink WI only)”. | Consequence if the feature is not supported by the UE | Type(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC) |
| 59. NR\_MIMO\_Ph5 | 59-2-1-1 | Enhanced Type-I SP codebook for 64 ports – Scheme-A | 1. Support of enhanced Type-I SP codebook for Scheme-A with 64 Tx ports by aggregating multiple NZP CSI-RS resourceswithin one slot2. A list of supported combinations, each combination is {Max # of resources and total # of Tx ports} across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously3. Supported maximum rank4. Max # of CSI-RS resource in a resource set5. Supported processing capability | 2-35 | Yes | n/a | Enhanced Type-I SP codebook is not supported for 64 ports – Scheme-A, aggregated CSI-RS resources within one slot | Per band and per BC |
| 59. NR\_MIMO\_Ph5 | 59-2-1-1a | Enhanced Type-I SP codebook for 48 ports – Scheme-A | 1. Support of enhanced Type-I SP codebook for Scheme-A with 48 Tx ports by aggregating multiple NZP CSI-RS resources within one slot2. A list of supported combinations, each combination is {Max # of resources and total # of Tx ports} across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously3. Supported maximum rank4. Max # of CSI-RS resource in a resource set5. Supported processing capability | 59-2-1-1 | Yes | n/a | Enhanced Type-I SP codebook is not supported for Scheme-A for 48 Tx ports, aggregated CSI-RS resources within one slot | Per band and per BC |

**Question 2:** how do we define pre-requisite if pre-requisite is also per band and per BC capabilities?

In case of 59-2-1-1a, the pre-requisite is 59-2-1-1 which is also per band and per BC.

In order to indicate 59-2-1-1a in CA\_n1\_n2 (per BC capability), should UE also indicate 59-2-1-1 in CA\_n1\_n2 (per BC capability)? Or is it also considered to be met for pre-requisite if UE indicates 59-2-1-1 in band 1 or band 2 (per band capability)?

**2. Actions:**

**To RAN1:**

**ACTION:** RAN2 respectfully asks RAN1 to provide answer for the questions above.

**3. Dates of Next RAN2 Meetings:**

RAN2#131bis 13th to 17th October 2025 Prague, CZ

RAN2#132 17th to 21st November 2025 Dallas, US