

3GPP TSG-RAN WG4 Meeting # 101-e R4-211XXXX

Electronic Meeting, 1<sup>st</sup> – 12<sup>th</sup> November, 2021

**Agenda item:** 12.2.1

**Source:** Moderator (RAN4 Chair)

**Title:** Moderator summary for discussion [101-e][140] NR\_basket\_R18

**Document for:** Information

---

## 1 Introduction

In Rel-17 the redundancy and conflict of CRs/draft CRs across the basket WIs were observed, which were thought to result in the extra workload and degradation of specification quality. This email triggers the discussion to collect the potential solution(s) to improve the organization of Rel-18 basket WIs.

The potential solution(s) and corresponding comments will be captured in this summary document as input for discussion in the future RAN plenary.

---

## 2 Discussion

### 2.1 1st round discussion

#### 2.1.1 Collection of potential solutions and comments

The following contribution was submitted under AI 12.2.1, which can be used to trigger the discussion.

#### **R4-2118723 Discussion on how to arrange the Rel-18 basket WI**

*Type: discussion For: Discussion*

*Source: Huawei, HiSilicon*

- **Proposal 1:** RAN4 can consider to establish one or two LTE basket WI(s) in Rel-18.
- **Proposal 2:** In Rel-18, NR\_CA\_R17\_3BDL\_1BUL and NR\_CA\_R17\_3BDL\_1BUL can be merged into one basket WI. And NR\_CA\_R17\_4BDL\_1BUL and NR\_CADC\_R17\_4BDL\_2BUL can be merged into one basket WI.
- **Proposal 3:** it's proposed to merge the following ENDC basket WIs due to lack key technical analysis in Rel-18.
  - DC\_R17\_3BLTE\_1BNR\_4DL2UL + DC\_R17\_4BLTE\_1BNR\_5DL2UL + DC\_R17\_5BLTE\_1BNR\_6DL2UL can be merged to one basket WI

- => more than 2 LTE bands + 1 NR band with one LTE UL + one NR UL
  - DC\_R17\_xBLTE\_yBNR\_3DL3UL + DC\_R17\_xBLTE\_2BNR\_yDL3UL can be merged to one basket WI
    - => more than 1 LTE bands + 1 NR FR1 band + one NR FR2 band with one LTE UL + one NR FR1 UL + one NR FR2 UL
  - DC\_R17\_xBLTE\_3BNR\_yDL2UL + DC\_R17\_xBLTE\_4BNR\_yDL2UL
    - => X LTE bands + more than 2 NR bands with one LTE UL + one NR UL
- **Proposal 4: There is no need to establish new TR for these basket WIs which only include the analysis of operating bands, configurations and Tib/Rib in Rel-18.**

Please provide you comments on

- Proposals from R4-2118723
- The other (alternative) solution (s)

in the table below.

**Feedback Form 1:**

**1 – Nokia Denmark**

We think the best basket split for **LTE CA** is:

- One basket - Including all LTE baskets, but we are open to discuss if it due to predicted workload should be split into two.

We think the best basket split for **NR CA** is:

- One basket - Including: NR\_CA\_R17\_intra
- One basket - Including: NR\_CADC\_R17\_2BDL\_xBUL
- One basket - Including: NR\_CA\_R17\_3BDL\_1BUL and NR\_CADC\_R17\_3BDL\_2BUL
- One basket - Including: NR\_CA\_R17\_4BDL\_1BUL, NR\_CADC\_R17\_4BDL\_2BUL and NR\_CADC\_R17\_5BDL\_1BUL

We think the best basket split for **NR DC** is:

- One basket - Including: DC\_R17\_1BLTE\_1BNR\_2DL2UL
- One basket - Including: DC\_R17\_2BLTE\_1BNR\_3DL2UL
- One basket - Including: DC\_R17\_3BLTE\_1BNR\_4DL2UL, DC\_R17\_4BLTE\_1BNR\_5DL2UL and DC\_R17\_5BLTE\_1BNR\_6DL2UL
- One basket - Including: DC\_R17\_xBLTE\_2BNR\_yDL2UL
- One basket - Including: DC\_R17\_xBLTE\_yBNR\_3DL3UL, DC\_R17\_xBLTE\_2BNR\_yDL3UL, DC\_R17\_xBLTE\_yDL3UL, DC\_R17\_xBLTE\_3BNR\_yDL2UL and DC\_R17\_xBLTE\_4BNR\_yDL2UL

## 2 – Skyworks Solutions Inc.

In our view the baskets should be organized based on the needed coex study work and hierarchy in terms of combinations order so essentially:

1)intra-band needs MSD/A-MPR studies => dedicated basket including NR CA, ENDC, NEDC, NRDC

2)two-band 1UL or 2UL need Harmonic or IMD analysis => dedicated basket including NR CA, ENDC, NEDC, NRDC

3)three band 2UL needs IMD analysis to 3rd band => dedicated basket including NR CA, ENDC, NEDC, NRDC after all two-band fallbacks are finished.

4)all other higher order cases are mostly to register combinations and if deltaT deltaR framework is fixed then it should be automatic with CRs and could all reside in the same basket and approved as long as fallbacks are complete.

Same approach for LTE only cases

5) cases with FR2 added

we may need to see what happens in R18 for FR2-1 and FR2-2 CAs.

## 3 – Qualcomm Incorporated

In general, we prefer to classify the Rel-18 basket items as LTE CA, NR CA/DC, and EN-DC/NE-DC.

For LTE CA basket, we can have two baskets:

- LTE\_CA\_R17\_xBDL\_1BUL to include all the legacy LTE baskets with one UL band
- LTE\_CA\_R17\_xBDL\_2BUL to include all the legacy LTE baskets with two UL bands

For NR CA/DC basket, we can have following baskets:

- NR\_CAR\_17\_intra
- NR\_CADC\_R17\_2BDL\_xBUL
- NR\_CADC\_R17\_3BDL\_xBUL to include NR\_CA\_R17\_3BDL\_1BUL and NR\_CADC\_R17\_3BDL\_2BUL
- NR\_CADC\_R17\_4BDL\_xBUL to include NR\_CA\_R17\_4BDL\_1BUL and NR\_CADC\_R17\_4BDL\_2BUL
- NR\_CADC\_R175\_BDL\_xBUL

For EN-DC basket, we are OK with Proposal 3 in R4-2118723.

## 4 – T-Mobile USA Inc.

We support Proposal 2 to improve reduce redundancy and reduce errors, but we think there is a typo (in **bold**).

Proposal 2: In Rel-18, NR\_CA\_R17\_3BDL\_1BUL and NR\_CA\_R17\_3BDL\_2BUL can be merged into one basket WI. And NR\_CA\_R17\_4BDL\_1BUL and NR\_CADC\_R17\_4BDL\_2BUL can be merged into one basket WI.

We are also fine with the proposals from Nokia and Qualcomm above.

## 5 – AT&T GNS Belgium SPRL

We support the proposals in R4-2118723 and note the same typo item raised by T-Mobile but it should also include DC as follows, NR\_CADC\_R17\_3BDL2BUL. We believe that the NR\_DC case should be combined with the NR\_CA case. There is no need to separate. For LTE CA, we prefer 1 WID to capture both 1UL and 2UL cases since the workload is not very high and this follows the same approach proposed for NR to minimize redundancy and errors.

## 6 – HUAWEI Technologies Japan K.K.

Thank all the companies for the suggestions and pointing out this typo. It seems RAN4's common understanding that some Basket WIDs for band combinations can be reduced and merged in Rel-18. We are open to discuss the potential solution proposed by other companies.

### 2.1.2 Summary for 1st round

6 companies provided the comments. All the companies seemed OK to merge and reduce the number of existing basket WIs. Basically there would be two ways to do it. One alternative way is to keep three categories, i.e., LTE CA, NR CA/DC and MR DC and then consolidate basket WIs. The other alternative way is to categorize the basket WIs according to the need of co-existence study and hierarchy in terms of combination order.

## 2.2 2nd round

### 2.2.1 Collection of potential solutions and comments

The following alternatives are summarized.

#### – Alternative 1a:

- LTE CA:
  - Establish one or two LTE basket WIs
- NR CA/DC
  - NR\_CADC\_R17\_3BDL\_1BUL and NR\_CADC\_R17\_3BDL\_2BUL can be merged into one basket WI.
  - NR\_CADC\_R17\_4BDL\_1BUL and NR\_CADC\_R17\_4BDL\_2BUL can be merged into one basket WI.
- MR DC
  - DC\_R17\_3BLTE\_1BNR\_4DL2UL + DC\_R17\_4BLTE\_1BNR\_5DL2UL + DC\_R17\_5BLTE\_1BNR\_6DL2UL can be merged to one basket WI
    - => more than 2 LTE bands + 1 NR band with one LTE UL + one NR UL
  - DC\_R17\_xBLTE\_yBNR\_3DL3UL + DC\_R17\_xBLTE\_2BNR\_yDL3UL can be merged to one basket WI
    - => more than 1 LTE bands + 1 NR FR1 band + one NR FR2 band with one LTE UL + one NR FR1 UL + one NR FR2 UL
  - DC\_R17\_xBLTE\_3BNR\_yDL2UL + DC\_R17\_xBLTE\_4BNR\_yDL2UL
    - => X LTE bands + more than 2 NR bands with one LTE UL + one NR UL
- There is no need to establish new TR for these basket WIs which only include the analysis of operating bands, configurations and Tib/Rib in Rel-18.

#### – Alternative 1b:

- LTE CA

- One basket - Including all LTE baskets, but we are open to discuss if it due to predicted workload should be split into two
- NR CA/DC
  - One basket - Including: NR\_CA\_R17\_intra
  - One basket - Including: NR\_CADC\_R17\_2BDL\_xBUL
  - One basket - Including: NR\_CA\_R17\_3BDL\_1BUL and NR\_CADC\_R17\_3BDL\_2BUL
  - One basket - Including: NR\_CA\_R17\_4BDL\_1BUL, NR\_CADC\_R17\_4BDL\_2BUL and NR\_CADC\_R17\_5BDL\_xBUL
- MR DC
  - One basket - Including: DC\_R17\_1BLTE\_1BNR\_2DL2UL
  - One basket - Including: DC\_R17\_2BLTE\_1BNR\_3DL2UL
  - One basket - Including: DC\_R17\_3BLTE\_1BNR\_4DL2UL, DC\_R17\_4BLTE\_1BNR\_5DL2UL and DC\_R17\_5BLTE\_1BNR\_6DL2UL
  - One basket - Including: DC\_R17\_xBLTE\_2BNR\_yDL2UL
  - One basket - Including: DC\_R17\_xBLTE\_yBNR\_3DL3UL, DC\_R17\_xBLTE\_2BNR\_yDL3UL, DC\_R17\_xBLTE\_3BNR\_yDL3UL, DC\_R17\_xBLTE\_3BNR\_yDL2UL and DC\_R17\_xBLTE\_4BNR\_yDL2UL

– **Alternative 1c:**

- LTE CA
  - LTE\_CA\_R17\_xBDL\_1BUL to include all the legacy LTE baskets with one UL band
  - LTE\_CA\_R17\_xBDL\_2BUL to include all the legacy LTE baskets with two UL bands
- NR CA/DC
  - NR\_CAR\_17\_intra
  - NR\_CADC\_R17\_2BDL\_xBUL
  - NR\_CADC\_R17\_3BDL\_xBUL to include NR\_CA\_R17\_3BDL\_1BUL and NR\_CADC\_R17\_3BDL\_2BUL
  - NR\_CADC\_R17\_4BDL\_xBUL to include NR\_CA\_R17\_4BDL\_1BUL and NR\_CAD\_CR17\_4BDL\_2BUL
  - NR\_CADC\_R175\_BDL\_xBUL
- MR DC
  - DC\_R17\_3BLTE\_1BNR\_4DL2UL + DC\_R17\_4BLTE\_1BNR\_5DL2UL + DC\_R17\_5BLTE\_1BNR\_6DL2UL can be merged to one basket WI
    - => more than 2 LTE bands + 1 NR band with one LTE UL + one NR UL
  - DC\_R17\_xBLTE\_yBNR\_3DL3UL + DC\_R17\_xBLTE\_2BNR\_yDL3UL can be merged to one basket WI
    - => more than 1 LTE bands + 1 NR FR1 band + one NR FR2 band with one LTE UL + one NR FR1 UL + one NR FR2 UL
  - DC\_R17\_xBLTE\_3BNR\_yDL2UL + DC\_R17\_xBLTE\_4BNR\_yDL2UL
    - => X LTE bands + more than 2 NR bands with one LTE UL + one NR UL

– **Alternative 2:**

- 1)intra-band needs MSD/A-MPR studies => dedicated basket including NR CA, ENDC, NEDC, NRDC
- 2)two-band 1UL or 2UL need Harmonic or IMD analysis => dedicated basket including NR CA, ENDC, NEDC, NRDC

- 3)three band 2UL needs IMD analysis to 3rd band => dedicated basket including NR CA, ENDC, NEDC, NRDC after all two-band fallbacks are finished.
- 4)all other higher order cases are mostly to register combinations and if detaT deltaR framework is fixed then it should be automatic with CRs and could all reside in the same basket and approved as long as fallbacks are complete.
- NOTE: Same approach for LTE only cases
- 5) cases with FR2 added

Please provide your comments further in the second round.

**Feedback Form 2:**

--

---

### 3 Conclusions