**3GPP TSG-RAN Meeting #104 RP-241602**

**Shanghai, China, June 17-20, 2024**

**Title:** Moderator summary for Rel-19 RAN4 Baskets

**Agenda item:** 9.1.5

**Source:** RAN4 Chair (Huawei)

**Document for:** Report

# Introduction

This contribution summarizes the offline draft session discussions for Rel-19 RAN4 basket WIs.

# Disucssions on how to consolidate the basket WIs

The proposals from RAN4 Chair were summarized below. And the RP-240894 was endorsed in prinicple on Monday session in RAN#104 meeting. The corresonding table capturing the idea for consolication is copied below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Category** | **Rel-18 basket WIs** | | **Rel-19 basket WIs proposal** | | **TR** | **Scope** |
| EN-DC basket | 6 items | DC\_R18\_1BLTE\_1BNR\_2DL2UL (RP-241218)  DC\_R18\_2BLTE\_1BNR\_3DL2UL (RP-241246)  DC\_R18\_xBLTE\_1BNR\_yDL2UL (RP-241167)  DC\_R18\_xBLTE\_2BNR\_yDL2UL (RP-241331)  DC\_R18\_xBLTE\_yBNR\_zDL2UL (RP-241228)  DC\_R18\_xBLTE\_yBNR\_zDL3UL (N/A) | **DC\_R19\_xBLTE\_yBNR**   * Obj#1: DC\_R19\_1BLTE\_1BNR\_2DL2UL * Obj#2: DC\_R19\_xBLTE\_yBNR\_3DL2UL (x+y=3) * Obj#3: DC\_R19\_xBLTE\_yBNR\_zDLqUL (x+y>3, 3<z≤6, 2≤q≤3) * Obj#4: DC\_R19\_LTE\_NR\_SUL\_combos | 1 item | Yes  Yes  No  No | Incl. 2Tx/3Tx Incl. 2Tx/3Tx Incl. 2Tx/3Tx |
| NR CA/DC/SUL basket | 6 items | NR\_CA\_R18\_Intra (RP-241141)  NR\_CADC\_R18\_2BDL\_xBUL (RP-241227)  NR\_CADC\_R18\_3BDL\_xBUL (RP-241092)  NR\_CADC\_R18\_yBDL\_xBUL (RP-241329)  NR\_SUL\_combos\_R18 (RP-241249)  NR\_2SUL\_cell\_combos\_R18 (RP-241204) | **NR\_CADC\_SUL\_R19**   * Obj#1: NR\_CA\_R19\_Intra * Obj#2: NR\_CADC\_R19\_2BDL\_xBUL * Obj#3: NR\_CADC\_R19\_3BDL\_xBUL * Obj#4: NR\_CADC\_R19\_yBDL\_xBUL (y>3) * Obj#5: NR\_SUL\_combos\_R19 | 1 item | Yes  Yes  Yes  Yes | Incl. 2Tx/3Tx, UL-MIMO/TxD+CA  Incl. 2Tx/3Tx, 3Tx UL-MIMO/TxD+CA  Incl. 2Tx/3Tx, 3Tx UL-MIMO/TxD+CA  Incl. 2Tx/3Tx, 3Tx UL-MIMO/TxD+CA |
| LTE basket | 1 item | LTE\_CA\_R18\_xBDL\_yBUL (RP-241243) | **LTE\_CA\_R19\_xBDL\_yBUL** | 1 item | Yes |  |
| V2X/SL | 1 item | NR\_LTE\_V2X\_PC5\_combos\_R18 (N/A) | N/A |  |  |  |
| HPUE basket | 7 items | HPUE\_NR\_FR1\_TDD\_R18 (RP-241203)  HPUE\_NR\_FR1\_FDD\_R18 (RP-241321)  LTE\_NR\_HPUE\_FWVM\_R18 (RP-240944) | **HPUE\_NR\_FR1\_bands\_R19** | 4 items | Yes  Yes  Yes  Yes | PC1/1.5/2, single F/T band, PC1 for FWVM  PC1/1.5/2, single LTE, PC1 for FWVM  PC1.5/2, 2Tx/3Tx  PC1.5/2, 2Tx/3Tx |
| LTE\_NR\_HPUE\_FWVM\_R18 (RP-240944) | **HPUE\_LTE\_bands\_R19** |
| HPUE\_FR1\_DC\_LTE\_NR\_R18 (RP-241145) | **HPUE\_DC\_LTE\_NR\_R19** |
| HPUE\_NR\_FR1\_TDD\_intra\_CA\_R18 (RP-241255)  HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18 (RP-241310)  HPUE\_FR1\_FDD\_NR\_CADC\_R18 (RP-241322) | **HPUE\_NR\_CADC\_SUL\_R19** |
| Other basket | 8 items | NR\_bands\_UL\_MIMO\_R18 (RP-241261, RP-241231/2, RP-241332)  4Rx\_NR\_bands\_R18 (RP-241229, RP-241230, RP-241048)  NR\_FDD\_bands\_R18\_redcap (N/A) | **NR\_bands\_xFeature\_R19** | 4 items | No  Yes  Yes  No | Incl. UL-MIMO, 4Rx, 8Rx, RedCap |
| DL\_intrpt\_combos\_TxSW\_R18 (RP-241311) | **DL\_intrpt\_combos\_TxSW\_R19** |
| LTE\_NR\_Simult\_RxTx\_R18 (RP-241252) | **LTE\_NR\_Simult\_RxTx\_R19** |
| NR\_bands\_R18\_BWs (RP-241176) | **NR\_bands\_R19\_BWs** |
| R18\_3Tx\_NR\_CA\_ENDC (RP-241085/6)  LTE\_bands\_R18\_M1\_M2\_NB1\_NB2 (Ericsson) |  |

According to offline discussions, the following issues need be discussed further:

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| **Issue #1: how to handle HPUE band combination WIs**   * Whether to merge HPUE EN-DC/NR-CA basket WIs into normal basket WIs (Nokia, Ericsson, AT&T) |

**Discussions:**

Qualcomm: support to merge them.

LGE: Keep PC3 in the normal basket.

Ericsson: What is the reason?

ZTE: OK to separate them. For the spreadsheet, it is difficult to merge them.

CATT: The worksplit should be clarified. The merger does not change the workload. We should follow the procedure first to work on normal PC and the high power.

OPPO: The movitation of consolidation is for the workload reduction form management. It is very difficult to merge further. Prefer to keep them separate.

Apple: prefer to keep HPUE separate from normal. The PC3 is prerequisite for HPUE.

Samsung: Prefer to have separate WIs. The pre-condition is PC3.

AT&T: Understand the argument. At the same time in the HPUE, there are three power classes. We still have the similar issue. Separate WIs does not help addressing the CR redundancy and spec quality issue.

Vivo: Support to separate WIs. PC3 should be introduced first.

Huawei: prefer to keep them separate. From procedure perspective. The requirements for normal PC and high power class are different.

CHTTL: Share the similar view as Apple and Vivo. In HPUE WIDs, we can say that PC3 and high power can be finished in the same meeting.

Nokia: Similar spreadsheet needs for seaprate WIDs. Support to merge them.

Verizon: Merging them does not impact the workload.

Apple: In SR, whether PC3 is finished needs be checked and clarified.

**Agreements:**

* **Keep PC3 and HPUE class band combiantions in the normal basket WIs and HPUE basket WIs separately.**
  + **In the WIDs of HPUE, the rule how to complete the work as described in TR will be captured.**

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| **Issue #2: How to handle 3Tx**   * How to capture 3Tx, in normal basket + HPUE basket or in HPUE basket only with fallback mode (OPPO) |

**Discussions:**

OPPO: Based on Rel-18 experience, people are only interested in the 3Tx HPUE.

CHTTL: What if companies only request PC3 with 3Tx.

CMCC: we do not nee worry about it.

CATT: Only HPUE is important. If there is such request, we can update the WID.

**Agreements:**

* **Capture 3Tx with high power classes and PC3 as fallback in HPUE\_DC\_LTE\_NR\_R19 and HPUE\_NR\_CADC\_SUL\_R19.**

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| **Issue #3: Whether and how to handle non-block approval aspects**   * A separate objective could be added to handle band combos under none-block approval process if necessary in the same basket, e.g., NR\_CADC\_SUL\_R19 (CATT) |

In the moderator’s view, which topic within the WI will be treated in non-block approval approach could be decided in RAN4 level. And in Rel-18 all the HPUE basket WIs were treated in non-block approval manner. There seems no need to have a dedicated objective for non-block approval process in WID.

**Discussions:**

**AT&T: Consider the block approval for HPUE basket WIs in the future RAN4 meeting.**

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| **Issue #4: Detailed objectives for each Rel-19 potential WIs**   * Detailed objectives are provided in the table below for discussions. |

**Agreement: (marked by Green)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **Rel-18 basket WIs** | | **Rel-19 basket WIs proposal** | | **TR** |
| EN-DC basket | 6 items | DC\_R18\_1BLTE\_1BNR\_2DL2UL (RP-241218)  DC\_R18\_2BLTE\_1BNR\_3DL2UL (RP-241246)  DC\_R18\_xBLTE\_1BNR\_yDL2UL (RP-241167)  DC\_R18\_xBLTE\_2BNR\_yDL2UL (RP-241331)  DC\_R18\_xBLTE\_yBNR\_zDL2UL (RP-241228)  DC\_R18\_xBLTE\_yBNR\_zDL3UL (N/A) | **DC\_R19\_xBLTE\_yBNR**   * Obj#1: DC\_R19\_1BLTE\_1BNR\_2DL2UL * Obj#2: DC\_R19\_xBLTE\_yBNR\_3DL2UL (x+y=3) * Obj#3: DC\_R19\_xBLTE\_yBNR\_zDLqUL (x+y>3, 3<z≤6, 2≤q≤3) * Obj#4: DC\_R19\_LTE\_NR\_SUL\_combos   Note: low band- low band combinations should not be under the block approval approaches by default. It is not precluded for RAN4 to discuss the band combination feasibility. | 1 item | Yes  Yes  No  Yes |
| NR CA/DC/SUL basket | 6 items | NR\_CA\_R18\_Intra (RP-241141)  NR\_CADC\_R18\_2BDL\_xBUL (RP-241227)  NR\_CADC\_R18\_3BDL\_xBUL (RP-241092)  NR\_CADC\_R18\_yBDL\_xBUL (RP-241329)  NR\_SUL\_combos\_R18 (RP-241249)  NR\_2SUL\_cell\_combos\_R18 (RP-241204) | **NR\_CADC\_SUL\_R19**   * Obj#1: NR\_CA\_R19\_Intra * Obj#2: NR\_CADC\_R19\_2BDL\_xBUL * Obj#3: NR\_CADC\_R19\_3BDL\_xBUL * Obj#4: NR\_CADC\_R19\_yBDL\_xBUL (y>3) * Obj#5: NR\_SUL\_combos\_R19   Note: low band- low band combinations should not be under the block approval approaches by default. It is not precluded for RAN4 to discuss the band combination feasibility.  Note: Include UL-MIMO/TxD + CA | 1 item | Yes  Yes  Yes  No  Yes |
| LTE basket | 1 item | LTE\_CA\_R18\_xBDL\_yBUL (RP-241243) | **LTE\_CA\_R19\_xBDL\_yBUL**   * Obj: follow RP-241243 | 1 item | Yes |
| V2X/SL | 1 item | NR\_LTE\_V2X\_PC5\_combos\_R18 (N/A) | N/A |  |  |
| HPUE basket | 7 items | HPUE\_NR\_FR1\_TDD\_R18 (RP-241203)  HPUE\_NR\_FR1\_FDD\_R18 (RP-241321)  LTE\_NR\_HPUE\_FWVM\_R18 (RP-240944) | **HPUE\_NR\_FR1\_bands\_R19**   * Obj#1: TDD band with PC1.5/2 for the different device types and PC1 only for FWVM * Obj#2: FDD band with PC2 for the different device types and PC1 only for FWVM   Note: The bands with the default power class shall be introduced before the high power UE is requested for this band. | 4 items | Yes  Yes  Yes  Yes |
| LTE\_NR\_HPUE\_FWVM\_R18 (RP-240944) | **HPUE\_LTE\_bands\_R19**   * Obj: PC2 with single Tx and PC1 only for FWVM   Note: The feasibility for PC1/PC2 needs be confirmed first |
| HPUE\_FR1\_DC\_LTE\_NR\_R18 (RP-241145) | **HPUE\_DC\_LTE\_NR\_R19**   * Obj: follow RP-241145 |
| HPUE\_NR\_FR1\_TDD\_intra\_CA\_R18 (RP-241255)  HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18 (RP-241310)  HPUE\_FR1\_FDD\_NR\_CADC\_R18 (RP-241322) | **HPUE\_NR\_CADC\_SUL\_R19, include 2Tx and 3Tx**   * Obj#1: Intra-band UL TDD HPUE and intra-band DL FDD HPUE with single UL carrier * Obj#2: Inter-band combinations with high power on TDD band(s) with or without SUL   + Include PC3 TDD +PC3 TDD case * Obj#3: Inter-band combinations with high power on FDD band(s)   + Include PC3 FDD +PC3 FDD case * Obj#4: inter-band combination with high power on either TDD, FDD band or both   + Include PC3 FDD + PC3 TDD cases   Note: for 3Tx, both high power classes and PC3 for band combinations will be included in this WID.  Note: The common requirements should be done first before working on the band specific requirements  Note: Include UL-MIMO/TxD + CA |
| Other basket | 8 items | NR\_bands\_UL\_MIMO\_R18 (RP-241261, RP-241231/2, RP-241332)  4Rx\_NR\_bands\_R18 (RP-241229, RP-241230, RP-241048)  NR\_FDD\_bands\_R18\_redcap (N/A) | **NR\_bands\_xFeature\_R19**   * Obj#1: UL-MIMO for single band * Obj#2: 4Rx * Obj#3: 8Rx * Other objectives can be added in the future if agreeable. | 4 items | No  Yes  Yes  Yes |
| DL\_intrpt\_combos\_TxSW\_R18 (RP-241311) | **DL\_intrpt\_combos\_TxSW\_R19**   * Obj: follow RP-241311 |
| LTE\_NR\_Simult\_RxTx\_R18 (RP-241252) | **LTE\_NR\_Simult\_RxTx\_R19**   * Obj: follow RP-241252 |
| NR\_bands\_R18\_BWs (RP-241176) | **NR\_bands\_R19\_BWs**   * Obj: follow RP-241176 or revised RP-241176 with adding CBW for n48 |
| R18\_3Tx\_NR\_CA\_ENDC (RP-241085/6)  LTE\_bands\_R18\_M1\_M2\_NB1\_NB2 (Ericsson) |  |

**Discussions:**

**Agreements:**

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| **Issue #5**   * For potential new NR single band, now HPUE(PC2+) is considered,  perhaps PC3 can also be considered into baskets (CATT) |

The clarificaiton on the proposal would be needed. The issue#5 was addressed in the discussions for issue#4.

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| **Issue #6: Spreadsheet inside the basket WIs**   * Whether to use the combined spreadsheet or not |

**Discussions:**

Ericsson/Nokia: perfer to merge into a single spreadsheet. Otherwise, there is no point to consolidate the WID.

LGE: it is easier for rapportuer to maintain the separate spreadsheets.

CATT: Only single excel file with multiple spread sheet.

CHTTL: RAN4 needs separate spreadsheet to be managed by multiple people. When companies requests the band combiantions, they request in one spreadsheet.

ZTE: In general we share the same view as CHTTL.

OPPO: Separate.

Nokia: We should avoid the mistake.

AT&T: for single spreadsheet, we prefer to have less spreadsheets. We do not like multiple spreadsheet for each objective.

**Agreements:**

* **Not to merge the spreadsheets (multiple files) in this meeting, and merge them into one spreadsheet with addtional collumn(s) to indicate the corresponding objective in the next meeting.**

# Recommended WF

The recommended WF is as follows.

**Agreements:**

* **Keep PC3 and HPUE class band combiantions in the normal basket WIs and HPUE basket WIs separately.**
  + **In the WIDs of HPUE, the rule how to complete the work as described in TR will be captured.**
* **Capture 3Tx with high power classes and PC3 as fallback in HPUE\_DC\_LTE\_NR\_R19 and HPUE\_NR\_CADC\_SUL\_R19.**
* **Not to merge the spreadsheets (multiple files) in this meeting, and merge them into one spreadsheet with addtional collumn(s) to indicate the corresponding objective in the next meeting.**

The agreements on the objectives for each WI are as follows marked by Green.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **Rel-18 basket WIs** | | **Rel-19 basket WIs proposal** | | **TR** |
| EN-DC basket | 6 items | DC\_R18\_1BLTE\_1BNR\_2DL2UL (RP-241218)  DC\_R18\_2BLTE\_1BNR\_3DL2UL (RP-241246)  DC\_R18\_xBLTE\_1BNR\_yDL2UL (RP-241167)  DC\_R18\_xBLTE\_2BNR\_yDL2UL (RP-241331)  DC\_R18\_xBLTE\_yBNR\_zDL2UL (RP-241228)  DC\_R18\_xBLTE\_yBNR\_zDL3UL (N/A) | **DC\_R19\_xBLTE\_yBNR**   * Obj#1: DC\_R19\_1BLTE\_1BNR\_2DL2UL * Obj#2: DC\_R19\_xBLTE\_yBNR\_3DL2UL (x+y=3) * Obj#3: DC\_R19\_xBLTE\_yBNR\_zDLqUL (x+y>3, 3<z≤6, 2≤q≤3) * Obj#4: DC\_R19\_LTE\_NR\_SUL\_combos   Note: low band- low band combinations should not be under the block approval approaches by default. It is not precluded for RAN4 to discuss the band combination feasibility. | 1 item | Yes  Yes  No  Yes |
| NR CA/DC/SUL basket | 6 items | NR\_CA\_R18\_Intra (RP-241141)  NR\_CADC\_R18\_2BDL\_xBUL (RP-241227)  NR\_CADC\_R18\_3BDL\_xBUL (RP-241092)  NR\_CADC\_R18\_yBDL\_xBUL (RP-241329)  NR\_SUL\_combos\_R18 (RP-241249)  NR\_2SUL\_cell\_combos\_R18 (RP-241204) | **NR\_CADC\_SUL\_R19**   * Obj#1: NR\_CA\_R19\_Intra * Obj#2: NR\_CADC\_R19\_2BDL\_xBUL * Obj#3: NR\_CADC\_R19\_3BDL\_xBUL * Obj#4: NR\_CADC\_R19\_yBDL\_xBUL (y>3) * Obj#5: NR\_SUL\_combos\_R19   Note: low band- low band combinations should not be under the block approval approaches by default. It is not precluded for RAN4 to discuss the band combination feasibility.  Note: Include UL-MIMO/TxD + CA | 1 item | Yes  Yes  Yes  No  Yes |
| LTE basket | 1 item | LTE\_CA\_R18\_xBDL\_yBUL (RP-241243) | **LTE\_CA\_R19\_xBDL\_yBUL**   * Obj: follow RP-241243 | 1 item | Yes |
| V2X/SL | 1 item | NR\_LTE\_V2X\_PC5\_combos\_R18 (N/A) | N/A |  |  |
| HPUE basket | 7 items | HPUE\_NR\_FR1\_TDD\_R18 (RP-241203)  HPUE\_NR\_FR1\_FDD\_R18 (RP-241321)  LTE\_NR\_HPUE\_FWVM\_R18 (RP-240944) | **HPUE\_NR\_FR1\_bands\_R19**   * Obj#1: TDD band with PC1.5/2 for the different device types and PC1 only for FWVM * Obj#2: FDD band with PC2 for the different device types and PC1 only for FWVM   Note: The bands with the default power class shall be introduced before the high power UE is requested for this band. | 4 items | Yes  Yes  Yes  Yes |
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| HPUE\_FR1\_DC\_LTE\_NR\_R18 (RP-241145) | **HPUE\_DC\_LTE\_NR\_R19**   * Obj: follow RP-241145 |
| HPUE\_NR\_FR1\_TDD\_intra\_CA\_R18 (RP-241255)  HPUE\_FR1\_TDD\_NR\_CADC\_SUL\_R18 (RP-241310)  HPUE\_FR1\_FDD\_NR\_CADC\_R18 (RP-241322) | **HPUE\_NR\_CADC\_SUL\_R19, include 2Tx and 3Tx**   * Obj#1: Intra-band UL TDD HPUE and intra-band DL FDD HPUE with single UL carrier * Obj#2: Inter-band combinations with high power on TDD band(s) with or without SUL   + Include PC3 TDD +PC3 TDD case * Obj#3: Inter-band combinations with high power on FDD band(s)   + Include PC3 FDD +PC3 FDD case * Obj#4: inter-band combination with high power on either TDD, FDD band or both   + Include PC3 FDD + PC3 TDD cases   Note: for 3Tx, both high power classes and PC3 for band combinations will be included in this WID.  Note: The common requirements should be done first before working on the band specific requirements  Note: Include UL-MIMO/TxD + CA |
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| NR\_bands\_R18\_BWs (RP-241176) | **NR\_bands\_R19\_BWs**   * Obj: follow RP-241176 or revised RP-241176 with adding CBW for n48 |
| R18\_3Tx\_NR\_CA\_ENDC (RP-241085/6)  LTE\_bands\_R18\_M1\_M2\_NB1\_NB2 (Ericsson) |  |