**3GPP TSG RAN #103 RP-240717**

**Maastricht, Netherlands, March 18-21, 2024**

**Agenda item: 9.1.4.6**

**Source: Apple (Moderator)**

**Title: Moderator's summary for discussion on Intra-band non-collocated CA/DC**

**Document for: Discussion**

# Introduction

In RP-240019 (Proposed Summary for RAN Rel-19 Package: RAN4 Part) prepared by RAN Chair and RAN4 Chair, the following proposed scope is endorsed as a starting point for discussion in RAN#103.



This document summarizes the relevant contributions on this topic and provides moderator recommendations for further discussions with an aim to reach an agreement on R19 WI scope.

# List of relevant contributions and their views

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| --- | --- | --- | --- |
| RP-240315 | Considerations for Release-19 RAN4-led WI/SIs | KT | consider Type 3 UE in Dec. ‘24 |
| RP-240262 | Other RAN4-led topics for Rel-19 | Nokia | If a WI in Rel-19 then only work on Type 4 requirements assuming MRTD>CP |
| RP-240434 | Views on other RAN4-led topics for Rel-19 | Huawei, HiSilicon | the following obejctives could be considered for the enhancement of intra-band non-collocated CA/DC:* Specify the requirements for type 4 receiver assuming MRTD>CP for FWA
	+ RF requirements: update power imbalance requirements if needed
	+ RRM core/performance requirements: update MTTD and MRTD requirements if needed and update the other requirements including scheduling restriction/availability, SCell operation related delay and interruption
	+ Demodulation: specify the PDSCH demodulation performance requirements if needed
	+ Try to reuse the existing type 2 requirements as much as possible
* FFS: Specify the requirements for Type3 requirements assuming MRTD<CP and power imbalance < X dB for handheld UE
	+ Check in Dec’ 2024.
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| RP-240547 | Views on Rel-19 RAN4 cross-area and other topics | Intel | Core part:1. Study the feasibility and specify support or non-co-located scenariosfor both FR1 inter-band non-contiguous EN-DC with overlapping orpartially overlapping bands and FR1 intra-band non-contiguous NRCAfor4-layer casewith separated Rx-chains• Investigate and specify the tolerable power imbalance and requiredarrival time differences between carriers• Specify MRTD andMTTD requirements and other identified RRM• Consider Type 4a/4b type of devices with 6/8 separated Rx chainsPerformance part:2. Specify RRM performance requirements and test cases3. Specify PDSCH demodulation requirements |
| RP-240101 | Motivation on supporting Intra-band non-collocated EN-DC/NR-CA deployment in Release 19 | KDDI, Docomo, KT, LG Uplus, SoftBank, Telecom Italia, Samsung | * Type 4 requirements assuming MRTD>CP for FWA, reusing Type 2 requirements
* (Not to include in March’24, but check in Dec’24) Type 3 requirements assuming MRTD<CP and power imbalance < X dB for handheld UE
	+ Without intended impacts on the network side
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| RP‑240495 | On intra-band non-collocated NR CA/EN-DC in R19 | Apple | Proposal 1: It is proposed to take X = 6dB as the baseline for type 3a/3b UE.Proposal 2: Network signaling to allow dynamic switching between 2MIMO layer (Type 2 UE) and 4MIMO layer (Type 3 UE) is preferred. |

# Moderator recommendations for further discussions

## Type 4 UE

It is agreeable to consider the following WI scope in the WID:

* Specify the core requirements for type 4 FWA UE (as defined in R4-2217734, WF on NonCol\_intraB\_ENDC\_NR\_CA for New Type UE) that supports non-co-located scenarios for both FR1 inter-band non-contiguous EN-DC with overlapping or partially overlapping bands and FR1 intra-band non-contiguous NR-CA for 4-layer DL MIMO, where MRTD>CP is assumed.
	+ RF power imbalance requirements
	+ RRM requirements including MTTD and MRTD requirements and other identified requirement such as scheduling restriction/availability, SCell operation related delay and interruption.
* Specify the corresponding performance requirements for type 4 FWA UE (as defined in R4-2217734, WF on NonCol\_intraB\_ENDC\_NR\_CA for New Type UE) that supports non-co-located scenarios for both FR1 inter-band non-contiguous EN-DC with overlapping or partially overlapping bands and FR1 intra-band non-contiguous NR-CA for 4-layer DL MIMO, where MRTD>CP is assumed.
	+ RRM performance requirements
	+ PDSCH demodulation performance requirements

Note: The requirements specified for type 2 UE should be reused as much as possible

## Type 3 UE

It is agreeable to check if the following scope can be added to the WI in Dec. 2024.

Specify the requirements for Type3 requirements assuming MRTD<CP and power imbalance < X dB for handheld UE.

# Offline discussions and conclusions

## Discussions

KDDI: it is better to add specific bands.

OPPO: to include both 4a and 4b

Apple: In R18, UE type is not bundled with MRTD. Are we going to define different UE types for co-located scenario? Or just use Type 1.

CATT: 4 layer per CC

## Conclusions

**4.2.1 Type 4 UE**

The WI scope was revised as follows with change marks:

* Specify the core requirements for type 4a/b FWA UE (as defined in R4-2217734, WF on NonCol\_intraB\_ENDC\_NR\_CA for New Type UE) that supports non-co-located scenarios for FR1 inter-band non-contiguous EN-DC with overlapping or partially overlapping bands and/or FR1 intra-band non-contiguous NR-CA for up to 4-layer DL MIMO per CC, where both RTD>CP and RTD < CP are included.
	+ RF power imbalance requirements of up to 25dB
	+ RRM requirements including MTTD and MRTD requirements and other identified requirement such as scheduling restriction/availability, SCell operation related delay and interruption.
	+ Work is limited to EN-DC/NR-CA for bands 42, n77/n78
	+ [Specify type 4a/b UE behavior in co-located scenarios (MRTD < CP) depending on whether network signaling is provided.]
* Specify the corresponding performance requirements for type 4a/b FWA UE.
	+ RRM performance requirements
	+ PDSCH demodulation performance requirements

**4.2.2 Type 3 UE**

It is agreeable to check if the following or similar scope can be added to the WI in Dec. 2024.

Specify the requirements for Type3 requirements assuming MRTD<CP and power imbalance < X dB for handheld UE.

* Without intended impacts on the network side