

3GPP TSG RAN Meeting #103

Maastricht, Netherlands, March 18-21, 2024

RP-240547

Views on Rel-19 RAN4 cross-area and other topics

Agenda Item:

9.1.4.6

Source:

Intel Corporation

Document for:

Discussion & Decision



Introduction

This contribution provides Intel's views on the scope of RAN4 Rel-19 cross-area and other objectives taking into consideration discussion and proposals in RAN #102 and RAN #103

- RAN #102:
 - RP-233920 "Moderator's summary for RAN4 Candidate Topics Impacting both RF/OTA and Demod/RRM for Rel-19"
 - RP-233921 "Moderator's summary for other RAN4 Rel-19 topics"
- RAN #103: RP-240019 "Proposed Summary for RAN Rel-19 Package: RAN4 Part" by RAN & RAN4 Chair

In accordance with RP-240019 the following set of cross-area and other WIs are being considered:

- Intra-band non-colocated CA/EN-DC
- ATG evolution
- Sidelink evolution
- NTN evolution
- NR Channel BW less than 5MHz for TN

In the following slides we provided views on objectives specific WI objectives

Intra-band non-colocated CA/EN-DC

Intel views

- Rel-19 project is required to complete the work started in Rel-18 timeframe and is aligned with requests from a number of operators.
- The work on UEs with 4-layer case with separated Rx-chains with can be prioritized (Type 4a/4b) for FWA in accordance with previous RAN4 assumptions on the reference UE architecture

UE Type	CC#	antenna / LNA		Mixer	Analog BB	#Rx	NRCA/ ENDC	power imbalance	comment
4a	1	4	6	4	4	4Rx	ENDC	25dB full range	Requires 6 antennas and LNA => FWA only
	2	2	total	2	2	2Rx			
4b	1	4	8	4	4	4Rx	NRCA	25dB full range	Requires 8 antennas and LNA => FWA only
	2	4	total	4	4	4Rx	ENDC		

The proposed WI objectives are provided below

Core part:

- Study the feasibility and specify support or non-co-located scenarios for both FRI inter-band non-contiguous EN-DC with overlapping or partially overlapping bands and FRI intra-band non-contiguous NR-CA for 4-layer case with separated Rx-chains
 - Investigate and specify the tolerable power imbalance and required arrival time differences between carriers
 - Specify MRTD and MTTD requirements and other identified RRM
 - Consider Type 4a/4b type of devices with 6/8 separated Rx chains

Performance part:

- Specify RRM performance requirements and test cases
- Specify PDSCH demodulation requirements

ATG & Sidelink

ATG evolution

- The work on the further Air-to-Ground evolution is proposed to be included in the Rel-19 package in RP-240019 with the focus on FRI CA scenarios
- We recommend to include the work on both intra-band and inter-band CA scenarios to make sure that the system can operate in a generic manner
- The proposed WI objectives are as follows:

Core part:

1. Evaluate and specify the necessary RF and RRM requirements for intra-band and inter-band CA for ATG.

Performance part:

1. Specify the necessary RRM performance requirements and test cases for intra-band and inter-band CA for ATG.

Sidelink Non-Contiguous intra-band CA

- The work on the Sidelink evolution is proposed to be included in the Rel-19 package in RP-240019 with the focus on intra-band non-contiguous CA scenarios
- The respective objective is aligned with 5GAA LS RP-240023
- The respective work is mostly RF-driven, while the existing Rel-18 RRM requirements can be reused, and no extra scope is anticipated
- The proposed WI objectives are as follows:

Core part:

1. Specify the necessary RF requirements for intra-band non-contiguous Sidelink CA with the focus on band n47.
 - Include CC combinations 10MHz + 10MHz and 10MHz + 20MHz for UE Power Class 2 (26 dBm) and Power Class 3 (23 dBm)

NTN evolution

Intel views

- Extensive discussions on NTN HPUE took discussion in RAN#101/102 in the scope of RAN2-led NTN work item and the general conclusion to have a separate RAN4-led project was reached.
- A number of candidate objectives were identified in RAN #102 covering a wide set of scenarios.
- **NTN HPUE:** To control the RAN4 workload we recommend to down-select or prioritize between PC1 and PC1.5 for NR NTN based on NTN industry inputs and commercial needs and focus on NTN FR1
- **NR Channel BW less than 5 MHz:** The work shall cover necessary RF/RRM/Demodulation requirements. To limit the scope, the work can focus on 3MHz CBW. No additional study stage is requirement.
- **NGSO testing:** The work shall focus on RRM/Demodulation performance requirements and consider to introduce realistic and testable NGSO propagation conditions.

The proposed WI objectives are provided below

Core part:

1. High power UE (HPUE) for NTN (RF)

- Introduce PC2 for NR/IoT NTN UE in NTN FR1 bands for both handheld and non-handheld
- [Introduce PC1 for NR NTN UE in NTN FR1 bands for non-handheld]
- [Introduce PC1.5 for NR NTN UE in NTN FR1 bands (2nd priority)]
- Conduct necessary co-existence studies NTN HPUEs

2. Introduce necessary RF/RRM requirements to support NR Channel BW less than 5 MHz for NTN bands

Performance part:

3. Introduce necessary NTN performance requirements for NTN UEs for NGSO (RRM/Demod)

- Define time varying channel models and parameters for NGSO scenarios
- RRM test cases
- UE demodulation requirements

4. Introduce necessary RRM and demodulation performance requirements to support NR Channel BW less than 5 MHz for NTN bands

NR Channel BW less than 5MHz for TN

Intel views

- The work on the NR Channel BW less than 5 MHz shall focus on the inter-band CA scenarios
- The work can be limited to RRM requirements, while specific inter-band CA combinations shall be introduced separately as a part of RAN4 spectrum items
- Inter-band CA scenarios shall be first identified in the RF session based on operators' inputs
- By default, recommend to prioritize inter-band CA scenarios with one of the carriers with legacy BW and one carrier with CBW < 5MHz

The proposed WI objectives are provided below

Core part:

1. Introduce RRM requirements for inter-band CA scenarios with Channel BW less than 5 MHz
 - Prioritize inter-band CA scenarios with one carrier with Channel BW less than 5MHz
 - The work shall start after RAN#104 and complete by RAN#106

Performance part:

2. RRM performance requirements and test cases for inter-band CA scenarios, where one of carriers has CBW < 5 MHz

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