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3GPP TSG RAN #94 RP-213279

Electronic Meeting, December 6th – 17th , 2021

Views on RAN4 Rel-18 Topics

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Document for: Discussion & Decision

Agenda Item: 8A.4

UE FR1 requirement evolution (1)

Interested Topics

- Supported working areas:
  - Enable 4Tx on a single band for FWA/CPE
  - Enable 8Rx for FWA/CPE on higher frequency bands (RAN4)
  - Investigate and enable 6Rx on higher frequency bands targeting at support of smartphone (RAN4)
    - Feasibility study includes performance gain and form factor, to identify whether smartphone can be supported or not
    - This should be a Study Item
  - Investigate and introduce lower MSD for inter-band CA/EN-DC combinations (RAN4)
    - A potential generic solution should be the target
    - This should be a Study Item
  - New low power class for Sidelink (14dBm)

UE FR1 requirement evolution (2)

Controversial Topics

- 3Tx use cases:
  - Enable two uplink bands with Tx switching transmission enhancement
    - We are supportive for this use case, however, it should belong to the Tx switching enhancement feature
  - CA+MIMO with 3Tx transmission simultaneously
    - One more active power supply and RF chain would add more interference/thermal effect/Power consumption
    - How to increase CA power to exceed power class limit is under discussion in new WI PowerLimitCA_DC. Enhancement can be considered after there is conclusion.
    - If not expect the outcome from PowerLimitCA_DC WI, but using current 26dBm power limit, then we are not clear how much benefits of this feature by achieving 26dBm with 3Tx chain simultaneously
    - This use case is not preferred currently
  - 3 bands inter-band UL CA
    - Not clear the practical deployment scenario for TDD+TDD+TDD
    - Self-interference issue may persist as the DL/UL configuration among different TDD bands can be different
    - Implementation complexity and self-interference issues will be increased dramatically
    - This use case can not be supported
  - 3Tx on single uplink band for MIMO enhancement
    - Agree that this use case should be dropped, including 3 layer and 1 layer
  - Transparent 3TxD
    - Transparent 2TxD is quite controversial topic from Rel-15 which takes more than 2 years, and some requirements are still under discussion with many open issues unsolved
    - For power enhancement at single band, no much gain is identified. Unless 26+26 is not sufficient for smartphone in the future
    - Predictable RAN4 Huge amount of work
    - 4Tx FWA/CPE project can be used as a path-breaker for this topic
    - This use case is not supported
- Simultaneous Rx/Tx for intra-band NC CA
  - The feasibility and benefit are not clear

UE FR2 requirement evolution (1)

Interested Topics

- Supported working areas:
  - Inter-band and intra-band DL/UL CA/DC RF enhancement in FR2-1 depending on operators' requests (RAN4)
    - Define RF requirement(s) for support of inter-band UL CA in FR2-1 based on CBM
  - RF enhancement in FR2-1 for 39GHz band
    - Vehicular UE requirements for power class in 39GHz
    - Vehicular UE requirements for inter-band DL/UL CA, e.g., 28+39GHz
  - Enhanced switching time (ON/ON transient time)
    - This is still under discussion in RAN4. If not solved in Rel-17, can be considered as an enhancement in Rel-18.
  - Other Rel-17 leftover topics

UE FR2 requirement evolution (2)

Controversial Topics

- Inter/intra-band DL/UL CA enhancement for FR2-2 and between FR2-1 and FR2-2 based on CBM/IBM
  - Antenna assumption and Single carrier requirements are still under discussion for FR2-2
  - FR2-1 only should be the 1st priority
  - Whether RAN4 will take efforts on this topic depending on operators' requests
- Spherical coverage enhancement for initial access
  - There is no initial access requirements for RAN4 RF
  - From test perspective, not clear how to test the initial condition
- UE antenna scaling
  - Benefits and feasibility should be studied first

OTA testing enhancement

Interested Topics

- Supported working areas:
  - Dynamic OTA testing method for FR2-1
    - Support the study of test methods, no new RAN4 requirements are expected
    - Rel-17 FR2 3D-MPAC system for MIMO OTA should be the basis for further consideration
  - Testing framework for FR2 FWA devices (PC1/PC5 in FR2)
    - This is already considered in RAN5 test specification, no new work is needed in RAN4
  - FR2 OTA testing for UEs with multi-panel reception
    - This depends on discussion outcome in Rel-17 FeMIMO
  - TRP TRS to cover RedCap UE type
    - Limited space for antenna design with only 1Rx makes “real” OTA performance of RedCap UE being more important
    - Test method is still unavailable
  - Other Rel-17 OTA leftover topics

Demodulation requirement evolution

Interested Topics

- Supported working areas:
  - UE advanced receiver (RAN4)
    - Evaluate and specify advanced receiver to cancel inter-user interference for MU-MIMO
  - Enhanced DL receivers for multi-DCI multi-TPR
  - Inter-cell CSI-RS/SSB interference mitigation (IM)
  - E-MMSE-IRC under uneven interference
  - BS advanced receiver (MMSE-IRC)

Others Topics

Interested Topics

- Supported working areas:
  - EMC enhancement
    - The scope is quite stable
  - ATG
    - The scope is quite stable
  - FR2 HST enhancement
    - The scope is quite stable

THANK YOU.
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