China Academy of Telecommunication Technology

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Further enhancements on multi-carrier in Rel-19

CATT

Outline

- Endorsed RAN chair's summary in RWS-230488
- Rel-19 potential objectives
  - Further enhancements on Rel-18 multi-carrier
  - Dynamic DL Rx carrier(s) switching
  - Single Cell over Multiple Bands (SCMB)
- Summary

Endorsed RAN chair's summary in RWS-230488

Additional RAN1-led Candidate Topics

- Low-power Wake-Up Signal (LP-WUS)/Wake-Up Radio (WUR)
  - A possible conversion from Rel-18 SI to Rel-19 WI.
  - Need to ensure successful completion of the SI and focus on essential areas
- Multi-carrier enhancements
  - The proposed areas for possible enhancements are quite diverging and wide
  - Careful examination is necessary in terms of real commercial needs
- Coverage Enhancements
- Positioning Enhancements
- SL evolution
  - If included, critical to focus on a limited set of possible areas addressing real commercial needs

Rel-19 potential objectives

- Objective 1: Further enhancements on Rel-18 multi-cell scheduling
  - Different SCS/carrier types among co-scheduled cells
  - Multiple scheduling cell for a scheduled cell, one for multi-cell scheduling and the other for self-scheduling

- Objective 2: Dynamic DL Rx carrier(s) switching
  - DL carrier switching among different carriers
  - Cross-carrier retransmission for DL and UL

- Objective 3: Single Cell over Multiple Bands
  - Multiple bands aggregated as a single cell
  - Single TB over multiple carriers

Further enhancements on Rel-18 multi-carrier

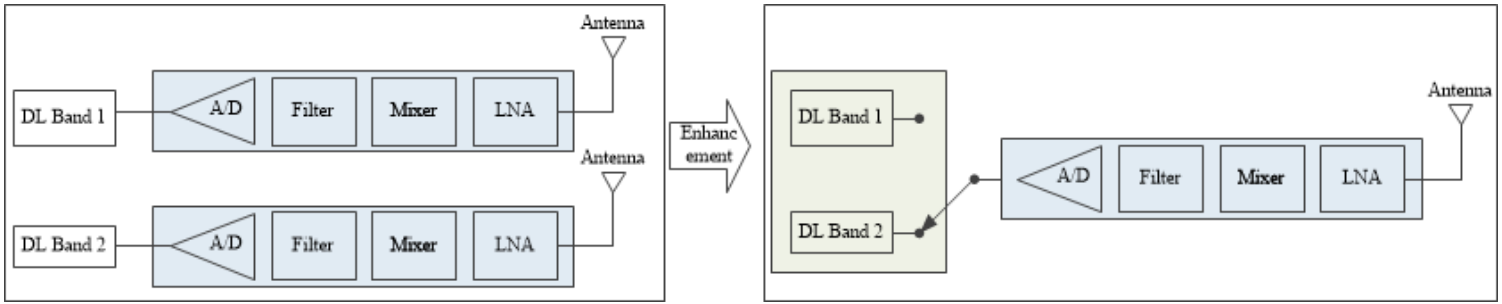
- Observations:
  - Due to limited TU of WI, the case of different SCSs/carrier types among co-scheduled cells was excluded from multi-carrier in Rel-18.
  - For each of scheduled cell, both of MC-DCI and legacy DCI should be monitored from a same scheduling cell.

- Motivations:
  - Further support scheduled cells with different SCS/carrier types scheduled by MC-DCI.
  - Offload the PDCCH burden on scheduling cell of MC-DCI.
  - Enable scheduled cells configured with MC-DCI scheduling and MBS DCI scheduling.

- Proposal 1: Support multi-cell PUSCH/PDSCH scheduling with different SCSs /carrier types for co-scheduled cells in Rel-19.
- Proposal 2: Support multiple scheduling cells for a scheduled cell, one for multi-carrier scheduling and the other for self-scheduling.

Dynamic DL Rx carrier(s) switching

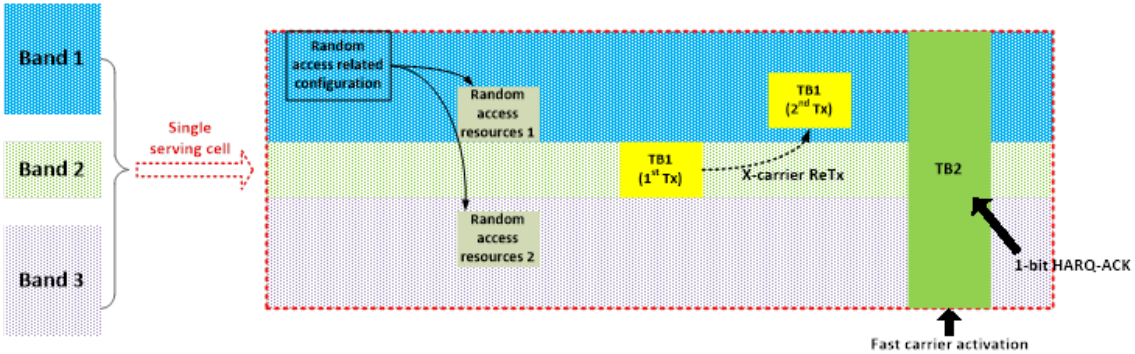
- Motivations:
  - There are more and more fragmented and scattered spectrum with narrower bandwidth in the future deployment.
  - For a UE with CA capability, higher baseband processing capability and stronger RF capability are required. However, the UE capability is limited.
  - Flexible scheduling and rapid adaptation to traffic requirement on the fragmented spectrum are necessary to achieve higher DL throughput.



- Proposal 3: Support dynamic DL Rx band(s) switching among different DL bands, including:
  - DL carrier switching among different carriers
  - Cross-carrier retransmission for DL and UL

Single Cell over Multiple Bands (SCMB)

- Motivations:
  - Due to the limited bandwidth of operators' spectrums and spectrum re-farming, more and more scattered spectrum resources with narrow bandwidth will be allocated to NR system in the future.
  - To use these fragmented spectrum with narrow bandwidth more efficiently, single cell over multiple bands (SCMB) can be studied in Rel-19.



- Proposal 4: Support Single Cell over Multiple Bands (SCMB) including:
  - Multiple bands aggregated as a single cell
  - Single TB over multiple carriers

Summary

Proposals:

- Proposal 1: Support multi-cell PUSCH/PDSCH scheduling with different SCSs /carrier types for co-scheduled cells in Rel-19.
- Proposal 2: Support multiple scheduling cells for a scheduled cell, one for multi-carrier scheduling and the other for self-scheduling.
- Proposal 3: Support dynamic DL Rx band(s) switching among different DL bands, including:
  - DL carrier switching among different carriers
  - Cross-carrier retransmission for DL and UL
- Proposal 4: Support Single Cell over Multiple Bands (SCMB) including:
  - Multiple bands aggregated as a single cell
  - Single TB over multiple carriers

THANK YOU