3GPP TSG RAN #102
Edinburgh, Scotland, December 11-15, 2023
Agenda: 9.1.5

RP-233591

Views on Spectrum topics for RAN4 Rel-19

China Telecom

2023.11

Focused Spectrum topics

Spectrum topics

- **Spectrum:**
  - RedCap HPUE
  - 800/900M UL CA
- **Basket WI:**
  - High power UE basket WIs
  - Multi Rx for NR bands (<2.6GHz) basket WI for 4Rx and 8Rx
  - Rel-19 downlink interruption basket WI for 4 bands combinations at dynamic Tx Switching in uplink

Note: this document is a subset of RP-233589 Views on RF/OTA/RRM topics for RAN4 Rel-19 in agenda 9.1.4.1, which intends to highlight our views on Spectrum topics in agenda 9.1.5.

Spectrum - RedCap HPUE

- Justification
  - » From coverage point, RedCap HPUE is quite necessary. Because typically the RedCap UE and non-RedCap normal UE are operated in the same network and on the same carrier. For non-RedCap normal UE, this is 3dB difference shortage comparing to PC2 UE. In addition, the antenna performance for RedCap UE may not enable good radiated power due to the size and cost constraints. Therefore, to extend cell coverage for NR deployment as well as improve the data rate of cell edge RedCap UE is quite necessary.
  - » In RAN #99, the following RAN task was assigned to RAN4:
    - To study how to enable HPUE including PC2 for RedCap in the band agnostic way
    - To study the applicable form factor, e.g., sensor, camera
  - » RAN4 discussed the RAN task in RAN4 #106-bis-e, RAN4 #107 and RAN4 #108 meetings, and has identified the specification impact, with three WFs approved in R4-2306650, R4-2310395 and R4-2314748 respectively.
- Proposal
  - » **It is proposed to consider this WI in Rel-19, a draft WID RP-233592 is submitted in agenda 9.1.5.**

Spectrum - 800/900 UL CA

- Justification
  - » Sub-1GHz plays the important role in wireless communication due to outstanding coverage performance, which on contrary made the sub-1GHz spectrum rare and fragmentally allocated in such as 700/800/900 MHz for IMT. The 800MHz and 900MHz can be operated under the co-construction and sharing business mode in China. Which is also captured in Rel-18 NR_700800900_combo_enh WI RP-230764 and specified with only one uplink supporting. For dual uplink CA, the approved WF R4-2314936 gives two options as
    - Support both 1UL/2DL and 2UL/2DL CA. Non-concurrent n5 DL and n8 UL
    - Support both 1UL/2DL and 2UL/2DL CA. Dedicated filter to allow simultaneous n5 DL and n8 UL
  - » However, the 2UL case was removed from Rel-18 in RAN #101 meeting.
  - » As the two uplink CA for n5 and n8 is necessary similar with other spectrum request and even play more important role for rural deployment scenario, these two solutions shall be reconsidered in Rel-19.
- Proposal
  - » **It is proposed to reconsider the solutions removed from Rel-18 for n5/n8 UL CA in Rel-19.**

Spectrum - basket WIs

- High power UE basket WIs
  - » Continued basket WIs for high power UE
    - For Rel-18 RP-232256 HPUE WI as instance, by now 769 band combinations are completed, 1223 band combs are ongoing and 351 new combs are requested in RAN#102. There will still be new requests expected. **Thus it's suggested to continue the HPUE basket works including new and continued WIs in Rel-19 to introduce new combs**.
  - » PC1.5 supporting for inter-band CA (PC2+PC2)
  - » PC1.5 supporting for intra-band CA (contiguous or non-contiguous)
    - **PC1.5 is supported only for single UL in Rel-18, it's suggested to introduce PC1.5(PC2+PC2) inter-band and intra-band combs in Rel-19.**
    - **If new PC1.5 basket WI is approved, it is suggested to refine the WI title and objectives with other high power UE basket WIs. The intention is to better categorize and trace them**
- Multi Rx for NR bands (<2.6GHz) basket WIs
  - » Capture 4Rx for NR bands(<2.6GHz) for FWA UE and handheld UE, 8Rx for NR bands(<2.6GHz) for FWA UE
- Rel-19 downlink interruption basket WI for 4 bands combinations at dynamic Tx Switching in uplink
  - » Capture mandating no downlink interruption for up to 4 bands combinations for tx switching in uplink

Thanks!