3GPP RAN Rel-19 Workshop
June 15th- 16th , 2023, Taipei, Taiwan
Agenda Item: 6

RWS-230225

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RAN4 Led Items for Rel-19

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Summary

- RAN4 Status
- Principles for Rel-19 RAN4 package approval
- Rel-19 proposals
- Towards the next generation

RAN4 Status

- RAN4 is handling >20 RAN4 led WIs(not including bands, baskets)
- RAN4 is also handling ~15 WIs led by other groups
- RAN4 meeting agenda has ~650 entries
- Documents marked as “Return to” on Friday before the session start in RAN4#107
  - UE RF session: 233
  - RRM session: 213
  - BSRF/demod/OTA: 162
- RAN4 is in charge of 25 NR specifications
- Quality of the specifications is very low
  - Specifications are extremely complicated, very difficult to decipher what are the requirements in many cases
- We (3GPP RAN) should seriously stop over-overloading RAN4
  - This cannot be simply enforced by the RAN plenary/WGs leadership, everyone has to show some discipline

Principles for Rel-19 RAN4 package approval

- Allocate TUs according to the actual RAN4 session handling
  - Do not split TUs just into RF/RD but RF/RRM/BS RF/OTA/Demod
  - Alternatively, move some items from Main/RRM session to the BSRF session, handle items in the same session in every meeting
    - Principle should be agreed before package approval and followed throughout the release
- Do not allocate <1TU for any non-spectrum item
  - Rel-18 TU allocations are too short, there is not enough time to have a good discussion to define requirements
  - RAN4 scoping of RAN1/2/3 led items is usually under estimating the actual time needed
- Limit approval to items with clear support (preferably operator support), do not approve leftovers or “basket” items (e.g. RF/RRM/demod enhancements) just out of “inertia”
- Maintain discipline on what is a spectrum item, limit the “wild card” approval to actual spectrum items
  - Items only requiring band/band combination specific work, not general requirements
  - See RP-212682

Rel-19 RAN4 led proposals - RF

Items which are continuations or based on items from previous releases

- Introduce a general framework for higher UE output power with CA
  - Currently only a limited set of power class combinations is covered by the specifications
  - Introducing combinations separately (e.g. PC3+PC2, PC2+PC2, PC2+PC1.5, etc)
  - Framework should cover all power class combinations for CA (including PC1.5)
  - Cover also possible leftovers from Rel-18: ATG power class definition, Coverage Enh. Framework, etc
- 4Rx for smartphones in <1GHz bands
  - Work expected to be limited since only conducted requirements are to be defined
- 6Rx for smartphones
  - 6L MIMO/4L MIMO with 6Rx
- NTN enhancements
  - UE PC2/PC1.5 for NTN
- SRS antenna switching enhancements – leftovers from 4Tx/8Rx if any

Rel-19 RAN4 led proposals - RRM

Items which are continuations or based on items from previous releases

- RedCap + NTN
  - Requirements for 1Rx for NTN
- Relaxed RRM requirements for other UE types
  - Extend relaxed RRM requirements beyond RedCap UEs
  - eDRX applicability to non-RedCap depending on Rel-18 progress
- Gap enhancements – per CC gaps
  - Measurement gaps cause an instant drop in UE throughput
  - Per CC gaps could enhance the UE throughput especially for higher order CA
    - Feature was already defined for LTE

Rel-19 RAN4 led proposals - Demod

Items which are continuations or based on items from previous releases

- Demodulation requirements for MU-MIMO with Rel-18 DMRS
  - Depending on Rel-18 progress in performance part
- Demodulation requirements for PDSCH FDM’d with PDCCH

Rel-19 RAN4 led proposals - OTA

Items which are continuations or based on items from previous releases

- Dynamic OTA testing for FR2
  - Study was proposed for previous releases
  - Target is to enable a more advanced platform for testing FR2 beam management in conditions closer to an actual deployment
  - Such testing platform becomes even more important for AI/ML enabled features
    - Current RRM testing environment is too simplistic to enable testing of more advanced features

Towards the next generation

Issues to consider for the future

- RAN4 work on a new release starts in practice at least 2 quarters after the other WGs
  - RAN4 package approval is late
  - RAN4 has to wait for conclusions from other groups to be able to finalize the requirements
  - Performance work ends at least 6 months after the core requirements work
  - Much time is spent on maintenance even after a release is formally closed
- RAN4 should start preparing for the future early
  - Several issues(see next page) should be solved in preparation for the next generation
  - Discussion should start early such that solutions are identified before starting the actual technical work for the next generation

Towards the next generation

Issues to be solved

- AI/ML requirements and testing
  - Many new issues that RAN4 has not discussed before, RAN4 as a group needs to develop a good understanding
  - Rel-18 SI only allocates 0.5TUs 6 meetings, unlikely that work can be concluded
  - AI/ML RAN4 study should continue from the start of Rel-19 without waiting for work in other groups
- New framework/paradigm needed for handling CA - not just small enhancements to current procedures
  - A lot of time spent in RAN4 on CA combos, specs are unreadable (tables with combinations are too heavy), many basket WIs, 100s of papers in each meeting
  - For example, see RP-171791
- RF specifications issues
  - Specs depend too much on implementation details (e.g. number of antenna connectors, number of PAs, etc)
  - Many sub-features discussed separately instead of having a general framework(e.g. PC handling with CA)
- RRM specifications issues
  - Too many corner cases, too many parameters and conditions to define a requirement (see number of “ifs” for a requirement)

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