3GPP TSG RAN Meeting #97-e

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Views on Network-controlled Repeaters (NCR) WI

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Rel-18 SI on NCR: Summary

- Rel-18 studies on NCR completed in RAN1/2/3
- RAN1 status and recommendations :
  - RAN1 agreed to recommend beam information as side control information, ON-OFF information as side control information, UL-DL TDD configuration and NCR's behavior over flexible symbols.
  - RAN1 did not make consensus on recommendation for power control
- RAN2/3 status and recommendations :
  - Regarding NCR identification and authorization, RAN2/3 captured total 4 solutions into TR 38.867 (with impact analysis and comparison of solutions), and agreed that down selection may take place in potential WI phase.
  - Some solutions pending confirmation from SA3/SA5 for which LS is sent [R3-225253]
  - RAN2 and RAN3 sent LS to RAN1 [R2-2208890 and R3-225254] saying the work is completed in RAN2/3 (with pCR [R2-2208888 and R3-225252] for TR 38.867)

Consideration on Rel-18 WI for NCR (1)

- Network-controlled repeater is supported for both FR1 and FR2.
  - Support both FR1 and FR2 to enable flexible deployments, with unified design for FR1 and FR2.
- Network-controlled repeater has no awareness of signals/channels to be forwarded.
  - The signals/channels to be forwarded should be transparent to the network-controlled repeater to avoid unnecessary complexity. Any design requiring awareness of forwarded contents should be excluded.
- Only side control information with RAN1 consensus in SI is to be specified.
  - Specify beam information and beam operation, ON-OFF information and ON-OFF operation, UL-DL TDD configuration and NCR's behavior over flexible symbols.
  - Not consider power control enhancement for WI.

Consideration on Rel-18 WI for NCR (2)

- High-layer aspects (NCR authorization solutions and impact on other WGs)
  - RAN based solution 1 provides authorization of the NCR-MT as a UE and additional authorization at RAN level based on OAM
    - RAN2/3 agreed that SA3 should evaluate the feasibility of the solution from security perspective
    - No SA/CT specification or CN impact, but may impact SA5 for NCR validation due to pre-configuration by OAM
  - OAM based solution 2 is a RAN only solution without CN or NAS
    - Current specifications will need to be updated to allow AS to initiate connection establishment without NAS or CN
    - No AS security possible for any RRC messages. May have potential issue when NCR and RAN are from different vendors and use different OAM servers.
    - RAN2/3 agreed that SA3 should evaluate the feasibility of the solution from security perspective
  - Authorization of NCR-MT in CN based solution 3 (with NCR indication in RRC) and 4 (without NCR indication in RRC)
    - Requires SA/CT groups to update their specification to include NCR authorization function
    - SA2/SA3/CT4 groups should be informed of the impact for this solution and feedback requested on feasibility to update the specification in Rel-18

Consideration on Rel-18 WI for NCR (3)

- Recommendation for NCR identification and authorization
  - As RAN3 already agreed and captured in TR 38.867, down-selection of solutions to be done in the WI phase (not at RAN plenary)
  - Requirement for consultation with SA3 should be captured in the WI for solution 1 and 2
  - SA2, CT4 and SA3 should be included as impacted specification groups for solution 3 and 4

Consideration on Rel-18 WI for NCR (4)

- RAN4 aspects
  - Noting that RAN4 did not participate in the SI, RAN4 will have to analyze the impact from the side control information to the RF Repeater specifications and update the RF Repeater specifications (TS 38.106, TS 38.115-1, TS 38.115-2) as required. It is expected that many of the NCR Repeater RF requirements will be common with the (Rel-17) RF Repeater.
  - Furthermore, RAN4 should determine whether any requirements need to be specified for the NCR-MT including consideration of whether IAB-MT requirements could be reused.

Proposed objectives for Rel-18 NCR WI

- Objective of Core part
  - Specify support for the following side control information for network-controlled repeater [RAN1, RAN2, RAN4]:
    - Beam information and NCR's beam operation
    - On/off information and NCR's on/off operation
    - UL-DL TDD configuration and NCR's operation over flexible symbols
  - Specify support for the network-controlled repeater management [RAN2, RAN3]
    - Identification and authorization of network-controlled repeaters
      - Down-selection from the 4 solutions in the TR 38.867
      - Coordinate with SA/CT groups as necessary
  - Specify RF requirements [RAN4]
    - Definition of network-controlled repeater RF requirements if needed
- Objective of Performance part
  - Specification of demodulation performance requirements for network-controlled repeater if needed [RAN4] .
  - Specification of conformance testing requirements for network-controlled repeater if needed [RAN4].

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