vivo

3GPP TSG RAN Meeting #92e RP-211153

Electronic Meeting, Jun. 14-18, 2021

WID scope revision for Rel-17 RedCap

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Agenda Item: 9.7.1.7

Background

- In RAN#90e meeting, a new WID on support of reduced capability NR devices was approved in [RP-202933].
- In RAN#91e meeting this WID was revised in [RP-210918], with the update on reduced bandwidth, minimum number of Rx branches, RedCap type, constraining, access restriction, as well as power saving features.
- The following parts are to be revisited in RAN#92e:

- **RRM relaxations for neighbouring cells for RedCap devices: for RRC_Idle/Inactive/Connected, considering the alternatives identified in the RedCap SI:**
  - **Study until RAN#92e, and, if agreed, specify RRM measurement relaxation criteria (where, for RRC_Idle/Inactive the Rel-16 mechanism is the baseline, and for RRC_Connected the mechanism reuses the Rel-16 RRM relaxation criteria from RRC_Idle/Inactive so as to maximize the commonality with Idle/Inactive UEs) [RAN2]**
    - **Enabling/disabling of RRM relaxation should be under the network's control. Specify both broadcast and dedicated signalling for enabling/disabling of RRM relaxation.**
  - **After RAN#92e, if agreed in RAN2, specify RRM measurement relaxation [RAN4]**
  - **No RRM relaxations are specified for the serving cell.**

RAN2 Status on RRM relaxation

- In RAN2#113bis-e and #114-e meeting, RRM relaxation in RRC_Idle/Inactive/Connected was discussed with the following agreements:

- Assuming there will be a stationary property based on subscription (which is FFS), we will not restrict to this and will continue to assume that a UE can use some RSRP/RSRQ based criteria (FFS whether reuse R16 thresholds or new ones. FFS also on the use of a beam based criteria)
- At least for RRC idle/inactive, a measurement-based R17 stationarity criterion can be configured separately from R16 low-mobility criterion for R17 UEs supporting the feature. FFS how the configuration is provided. FFS whether this stationarity criterion is based on:
  - the same algorithm used in R16 low-mobility criterion but with its own specific set of thresholds; and/or
  - a combination of R16 low-mobility criterion and/or beam-change based criterion. Exact details of beam change criterion are FFS.
- Network can configure R17 stationarity criterion/criteria together with a not-at-cell-edge criterion, to trigger RRM relaxations in RRC Idle/Inactive for R17 UEs supporting the feature. FFS whether the R16 not-at-cell-edge thresholds can be reused or separate R17 not-at-cell-edge thresholds are needed.
- An RSRP/RSRQ based stationarity criterion (Working Assumption: the same as in idle/inactive) can be configured for UEs in RRC Connected. If the criterion is met, this is reported to the network (FFS how/when). It is FFS whether, based on this, besides possibly reconfiguring RRM measurements (up to network implementation), the network can enable RRM measurement relaxation (FFS whether same method as in Idle/Inactive)
- Subscription based relaxation criteria will not be considered in Rel-17 RRM relaxation
- Reuse R16 low mobility criterion, as part or whole of Rel-17 stationary criterion in RRC_IDLE/INACTIVE. When NW configures both Rel-17 stationary criterion and Rel-16 low mobility criterion, NW configures different Rel-17 thresholds (i.e., SSearchDeltaP_stationary/TSearchDeltaP_stationary) from Rel-16 (SSearchDeltaP / TSearchDeltaP). How to configure the criterion (e.g. more stringent) is left to NW implementation (i.e. no specification impact to RAN2).
- Postpone the following discussion until RAN4 defines RRM relaxation method for Rel-17:
  - When NW configures both R16/R17 relaxation criteria and the UE fulfills both, UE performs:
  - Option 1) UE performs Rel-17 RRM relaxation method
  - Option 2) It is up to UE implementation to select either Rel-16 or Rel-17 relaxation operation
- Working Assumption: If beam-level criterion is adopted for Rel-17 stationary criterion in RRC_IDLE/INACTIVE, it is configured separately with Rel-16 low mobility criterion reused
- When NW configures Rel-17 RRM relaxation for RRC_IDLE/INACTIVE, Rel-17 stationary criterion is mandatory, and Rel-17 not-at-cell-edge criterion is optional configuration. FFS whether the same applies to RRC Connected.
- Continue discussion on Rel-17 not-at-cell-edge criterion in RRC_IDLE/INACTIVE within two options:
  - Option 1) Reuse Rel-16 not-at-cell-edge criterion with the same thresholds (i.e., SSearchThresholdP / SSearchThresholdQ)
  - Option 2) Reuse Rel-16 not-at-cell-edge criterion with the different thresholds

WID scope on RRM relaxation

- For RRM relaxation in RRC_Idle/Inactive, the criteria for stationary and not-at-cell-edge based on RSRP/RSRQ were discussed and agreed, while beam level based criteria is still being discussed in RAN2.
  - How to define R17 stationary and not-at-cell-edge criteria is being discussed in RAN2.
  - R16 low mobility criterion, could be reused as part or whole of Rel-17 stationary criterion. How to configure the criteria defined in R16 and R17 is up to NW implementation.
  - When NW configures both Rel-17 stationary criterion and Rel-16 low mobility criterion, the discussion on the corresponding UE behavior was postponed until RAN4 defines RRM relaxation method for R17.
- For RRM relaxation in RRC_Connected, it was agreed RSRP/RSRQ based criteria can be configured for UEs. If the criterion is met, UEs will report to network.
  - When/how to report to the network is being discussed in RAN2.
  - It is also FFS whether based on this, besides possibly reconfiguring RRM measurements (up to network implementation), the network can enable RRM measurement relaxation.
  - Whether the criteria in RRC_Connected are same as in RRC_Idle/Inactive is being discussed in RAN2.
- The RRM relaxation methods in RRC_Idle/Inactive/Connected have not been discussed in RAN2, which is expected to be determined in RAN4.
- With the above RAN2 progress, we think the scope for RRM relaxation could be:

Proposal: Include the following scope for RRM relaxation in RedCap WID

- **Specify support for the following RRM relaxation for neighbouring cells: for RRC_Idle/Inactive/Connected [RAN2, RAN4]:**
  - **Specify RRM measurement relaxation criteria for stationary and not-at-cell-edge based on RSRP/RSRQ [RAN2]**
    - **Enabling/disabling of RRM relaxation should be under the network’s control. Specify both broadcast and dedicated signalling for enabling/disabling of RRM relaxation.**
  - **Specify RRM measurement relaxation methods for R17 criteria. [RAN4, RAN2]**
  - **Specify the corresponding RRM relaxation mechanism, after RAN4 defines RRM relaxation method for R17, when NW configures both Rel-17 stationary criterion and Rel-16 low mobility criterion in RRC_Idle/Inactive. [RAN2, RAN4]**
  - **No RRM relaxations are specified for the serving cell.**

WID objective update - Proposals

- Specify support for the following RRM relaxation for neighbouring cells: ~~RRM relaxations for neighbouring cells for RedCap devices:~~ for RRC_Idle/Inactive/Connected~~, considering the alternatives identified in the RedCap SI: for RRC_Idle/Inactive/Connected~~: [RAN2, RAN4]
  - Specify RRM measurement relaxation criteria for stationary and not-at-cell-edge based on RSRP/RSRQ [RAN2] ~~Study until RAN#92e, and, if agreed, specify RRM measurement relaxation criteria (where, for RRC_Idle/Inactive the Rel-16 mechanism is the baseline, and for RRC_Connected the mechanism reuses the Rel-16 RRM relaxation criteria from RRC_Idle/Inactive so as to maximize the commonality with Idle/Inactive UEs) [RAN2]~~
    - Enabling/disabling of RRM relaxation should be under the network' s control. Specify both broadcast and dedicated signalling for enabling/disabling of RRM relaxation.
  - ~~After RAN#92e, if agreed in RAN2, s~~Specify RRM measurement relaxation methods for R17 criteria. [RAN4]
  - Specify the corresponding RRM relaxation mechanism, after RAN4 defines RRM relaxation method for R17, when NW configures both Rel-17 stationary criterion and Rel-16 low mobility criterion in RRC_Idle/Inactive, [RAN2, RAN4]
  - No RRM relaxations are specified for the serving cell.

THANK YOU.
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