3GPP TSG-RAN WG3 #112-e R3-212665

Online, May 17th - May 28th, 2021

Agenda Item: 10.2.3

Source: CMCC (moderator)

Title: Summary of support of inter-system inter-RAT energy saving

Document for: Discussion and Decision

# Introduction

**CB: # 1209\_SONMDT\_InterSystemEnergy**

**- Topics to discuss:**

**- Stage-2 and stage-3 details of minimum activation time**

**- Any other topic based on contributions submitted**

**- If possible, attempt to work on TPs – use summary of offline if needed**

(CMCC - moderator)

Summary of offline disc [R3-212665](file:///C:\Dropbox\Pentari%20Systems\RAN3\112-e\CB\CB%20%23%201209_SONMDT_InterSystemEnergy\Inbox\R3-212665.zip)

This CB# 1209 will be organized in two phases:

**Phase 1: Converge on Stage2 or Stage3 details of minimum activation time**

**Phase 2: Work on agreeable TPs**

The deadline for Phase 1 isThursday, May 20, end of day.

The deadline for Phase 2 depends on the progress of Phase 1.

# For the Chairman’s Notes

Proposal 1: Adopt compromised solution to go for Stage2 by merging option 2 and option 3.

Proposal 2: The NG-RAN node should keep the re-activated cell in active state for a certain time configured by OAM or by implementation if not configured.

Agree TP to 38.300 in R3-212805.

# Discussion

## Minimum Activation Time

In previous meetings, we reach the agreement that **minimum activation time to reduce ping-pong is beneficial.** There is still no alignment whether to specify the minimum activation time in stage 2 or stage 3. Regard to the reference papers, three options are proposed to handle the minimum activation time.

* **Option 1: Specify the minimum activation time in stage 3, same approach as LTE.**

The coverage cell sets the minimum activation time and sends the minimum activation time to the capacity cell [1][3].

* **Option 2: Specify the minimum activation time in stage 2. It should be configurable by OAM at the capacity cell.**

The minimum time an NG-RAN node's cell should remain activated upon reception of a re-activation request from an eNB [4].

* **Option 3: Specify the minimum activation time in stage 2.**

The NG-RAN node should keep the re-activated cell in active state for a certain time by implementation to avoid ping-pong effect and to wait UEs in the eNB to complete measurement towards the re-activated cell 2].

**Question 1: Which option do you prefer to handle the minimum activation time?**

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| Company | Comment |
| Qualcomm | We are okay with any option. Probably prefer option 1 to align it with LTE. Option 3 is also okay if we don’t want any RAN3 impacts.  Option 2 – We would need to send LS to SA5 to define an IE for minimum activation time if not present. |
| Nokia | (It seems that references for option 2 and 3 were inverted, so corrected above (rev marks)).  We think option 2 and 3 are more aligned with the LTE case than option 1, because as discussed in our paper the signalling based activation time concerned activations from 2G and 3G, not activations from 4G. The interaction with 2G and 3G had quite different time constants and impact on user QoE. We believe that the main question is whether to let the operator control the switch-on time, or whether this is purely left to implementations. If option 1 is chosen, and such operator control is felt beneficial, the OAM impact would come on the 4G side (coverage cell). However we don't see any benefit to configure this parameter on the coverage cell side, and believe that would just create unnecessary burden for the operator. It is therefore better to fully control this minimum switch-on time on the 5G side. Maybe a compromise between option 2 and option 3 would be a merge, i.e. that operator configuration is left optional (and if not configured, use an implementation dependent time as per R3-212011). |

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| Ericsson | Option 3. Agree with Nokia that we should keep control in 5G side, and booster cell probably knows better (learning from activation request received from coverage cell).  We can work on the wording to take into account the concerns about the configuration.  No need for an LS. In general, SA5 follows RAN3 progress (via company coordination) and takes RAN3 specs as reference. |
| Huawei | No strong view, every solution is OK for us, option 3 seems having minimum spec impact if it is acceptable as a compromise. |
| ZTE | We prefer option1 .  Similar with 3G/4G inter-system ES, in the case of 4G/5G ES, signalling based activation time concerned activations from 4G, not activations from 5G, The interaction with 4G also had quite different time constants and impact on user QoE.  Furthermore, Why we need keep the fully control of minimum activation time on the 5G side? The timer is configured for eNB to configure UE measurements and then to determine which cells should be actually to offload after UE measurements received, it is more reasonable to configure the timer value by the eNB.  For option3, in a real network, it is difficult to ensure that the implementation method on the NR capacity cell can fulfill the requirement. For option2, OAM configuration at inter-system may cause operability issues. Because we are discuss user case for inter system, OAMs in different system are not easy to estimate active timer of other system. |
| CMCC | Option 1 is preferable. We found some disadvantages of option 2 and 3. For option 2, since it is fully reply on capacity cell implementation, the coverage cell cannot know the minimum time the capacity cell will last before switching off. For option 3, configuration should be done at the coverage cell and capacity cell simultaneously. The configuration at multiple nodes may cause inter-operability issues.  If majority views support to specify the minimum activation time in stage 2. We can make a compromise and merge option 2 and option 3. |

Moderator summary:

It seems that we do not reach a convergence on this topic. Aiming to make progress, we provide a compromise solution to go for Stage2 by merging option 2 and option 3.

Proposal: The NG-RAN node should keep the re-activated cell in active state for a certain time configured by OAM or by implementation if not configured.

Stage2 TP is provided in dedicated paper.

# Conclusion, Recommendations [if needed]

If needed

# References

1. R3-212468 Discussion on inter-system inter-RAT energy saving, CMCC.
2. R3-212011 (TP for SON BL CR for TS 38.300): Minimum activation time for energy saving), Huawei.
3. R3-212141 Discussion on minimum activation time, ZTE.
4. R3-212328 (TP for BLCR to TS 38.300): Description of minimum activation time, Nokia.